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Handling and Melting Gray Iron

Washing Machine Plant Has Several Novel Features in Continuous-Pour Foundry—Double-Magnet Crane

FOR making gray iron castings, the Maytag Co., Newton, Iowa, has recently put into operation a new continuous melting unit. This foundry involves a number of novel features. The plant is located between two streets, with a dead-end railroad track entering the property, on which all incoming material must be received. The limited area available complicated the handling problem.

Fig. 1, a general view of the raw material yard taken from the roof of one of the manufacturing buildings, shows on the right one of the older manufacturing units, which includes the shipping department. On the left in the foreground is the charging platform of the new two-story gray iron foundry.

The raw material yard is spanned by a 75-ft. Shaw crane of special construction. The cage is located on one end of the trolley and the trolley is equipped with two 6-ton hoists, each of which handles a 65-in. Electric Controller & Mfg. Co. lifting magnet. In the congested yard area it is at times necessary to unload rapidly. As the output of the plant requires close to two carloads of pig iron a day, in addition to other incoming

Fig. 1—Special Yard Crane with Double-Hoist Trolley for Two Magnets. The cage is mounted on the end of the trolley so that the operator is always opposite his load. The two magnets are independently operated, to facilitate proper cleaning up of a car or the spotting of material at the dumping end. Most of the metal passes directly from incoming cars to the charging platform

material, it will be evident that speed in unloading is an essential factor.

With a single magnet we would have bridge and trolley travel for every magnet lifted. With two magnets lifting independently there is twice the capacity for the same number of bridge and trolley travels. This is accomplished by only a slight addition to the strength of the crane structure proper, the widening of the space between crane girders, and the introduction of the second hoisting unit. If the two magnets had been put in a rigid frame, so as to work together, they would not be so efficient, either in cleaning up a car or in delivering the stock on the charging platform, as with independent operation.

In operation the pig iron cars are spotted as nearly opposite the charging platform as possible and the operator drops one magnet into the car, turns on the current and starts this one up. He immediately drops in the second magnet, repeating the operation. Usually about to introduce metal into the cupola in the corner. The charging machine was furnished by the Chisholm-Moore Co., Cleveland.

Charges from new material and "foreign" scrap are made up in the larger buckets shown, the coke being put in first, then the pig, and then the scrap. There are two sets of charging scales on the platform, to minimize the distance the buckets must be pushed during the charging operation.

The smaller buckets shown on the platform are used for collecting sprues at the castings chutes on the first floor, where the castings come down from the foundry above. These buckets of sprues, brought up to the charging platform, are made up to a given weight either by addition or subtraction. They are charged on top of each regular charge, without additional handling. By this means the sprue in the continuous foundry is returned to the cupola within 90 min. of the time it flowed out of the spout as molten metal.

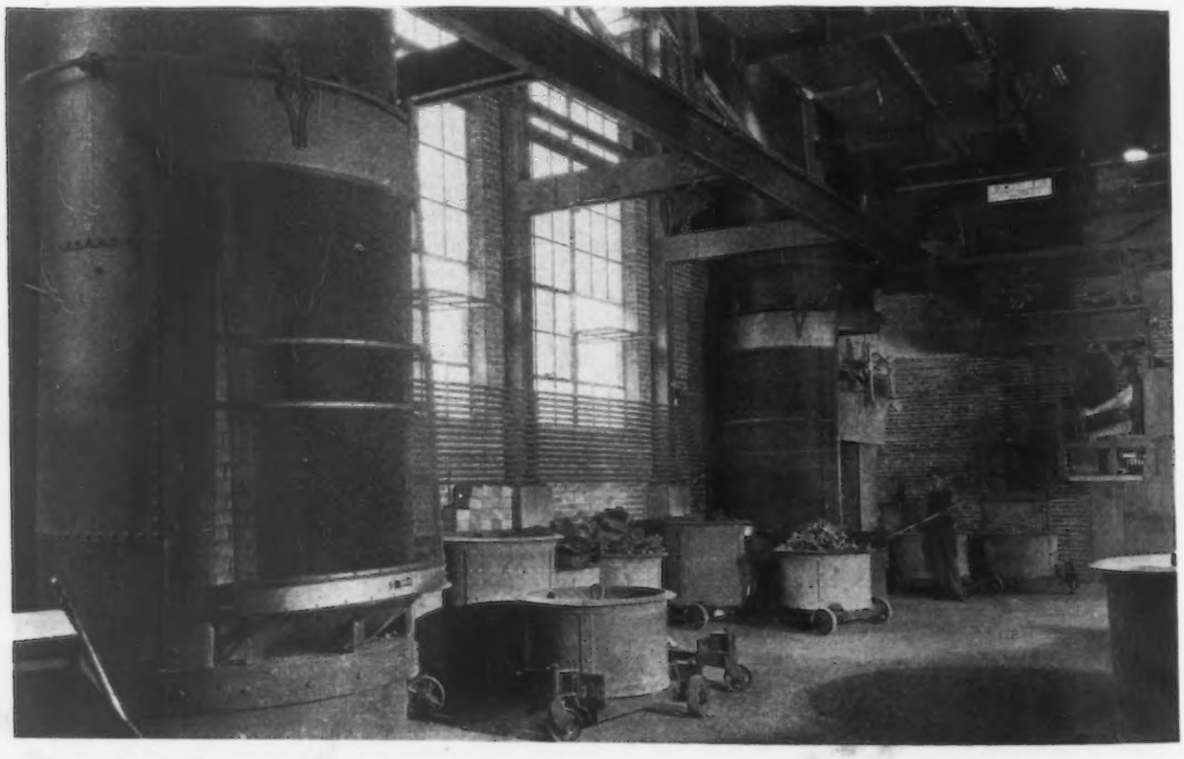


Fig. 2—Charging Platform, Showing Morgan Electric Charger. The smaller charging buckets are used for returning sprues from the foundry and the larger for making up the main charge with coke, pig iron and scrap

the incoming iron is so scheduled that practically all metal passes directly from the car to the charging platform and only the reserve pig is piled in the yard. At the time the photograph was taken the bins on the charging platform were nearly empty, waiting for an incoming shipment of metal.

It will be noted that the charging platform proper is surrounded by a wooden bulkhead with partitions, which serve to confine the different grades of pig and scrap used in making up the charges. As will be noticed, one of the bins on the platform is now used for limestone. The space under these bins is used for the storage of the winter supply of sand required for the foundry. This unit will be described later.

Old storage sheds shown in the center of this illustration are to be removed shortly, to give additional storage for material in the yard.

Method of Charging Cupolas

CHARGES are made up in charging buckets supported on small, three-wheeled carts, as shown in Fig. 2. This is a general view of the charging floor, with a number of the buckets, and the Morgan charger

Two standard Whiting continuous melting cupolas are used, equipped with wire screen doors which are pushed in place toward the end of the heat. These screens are not required during the regular charging operations as, with the continuous cupolas operated as they are, there is little flame at the charging door.

Control of the Blast

An important point in operating a continuous melt is to be equipped to trade pounds of air for pounds of iron. This is accomplished in the Maytag plant by the use of Wilbraham Green blowers operated by General Electric variable speed a.c. motors. The blower room is located between the two cupolas, on a mezzanine floor between the charging floor and the foundry floor proper.

To control the blast a series of blast gates made by the Steere Engineering Co. are employed, as shown in Fig. 3. This type of valve is air tight and so eliminates losses that generally accrue about slide valves. This illustration shows the location of the small control pipes leading to the Bacharach recording instrument.

When the blower shown on the right is used, the

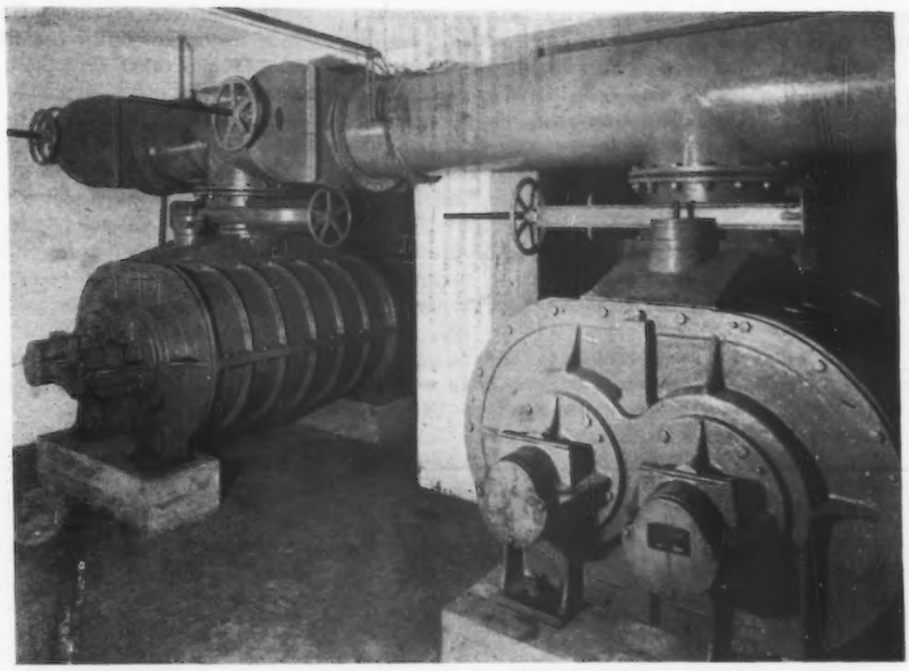


Fig. 3 — Wilbraham Green Blowers Driven by General Electric Variable Speed Motors. This shows the gate arrangement for controlling blast, over blowers, and small pipes for pressure control instrument

cupola beyond the blower on the left is in operation. In like manner the blower on the left is used to operate the cupola beyond the blower on the right. The object in this is to get a straight piece of pipe beyond the blower on the way to the cupola, in which a proper diaphragm can be introduced for use in connection with the Bacharach instrument. With this instrument it is possible to read accurately at all times both the pressure and the volume of air being furnished.

In addition to this, in the room adjacent to the blower room, over each cupola spout, there is a hole through which an optical pyrometer may be brought to bear upon the metal as it flows from the spout. The man in charge of the melting is constantly watching the temperature, volume and pressure, and at the same time is in constant touch with the charging operations of the platform above. By this careful control it has been found possible to melt continuously, day after day, at a ratio of 14½ lb. of iron per pound of coke used, including the bed, and at the same time to give iron of a proper grade for pouring the thin and delicate work required in a washing machine.

Continuous Receiving Ladle Used

FLOWING from the cupola in a continuous stream the metal is caught in a receiving ladle, as shown in Fig. 4. While this view was taken when the cupola was not in operation and the bottom was dropped, it shows the general arrangement about the base of the cupola. A short slot or notch in the back of the ladle makes possible the almost complete emptying of the ladle, without interfering with the stream of metal entering into it.

In practice two tap holes are used, the lower one flowing continuously and the upper one being opened only when the behavior of the iron shows that the metal is approaching the slag spout. The receiving ladle discharges its metal into a man-riding ladle crane

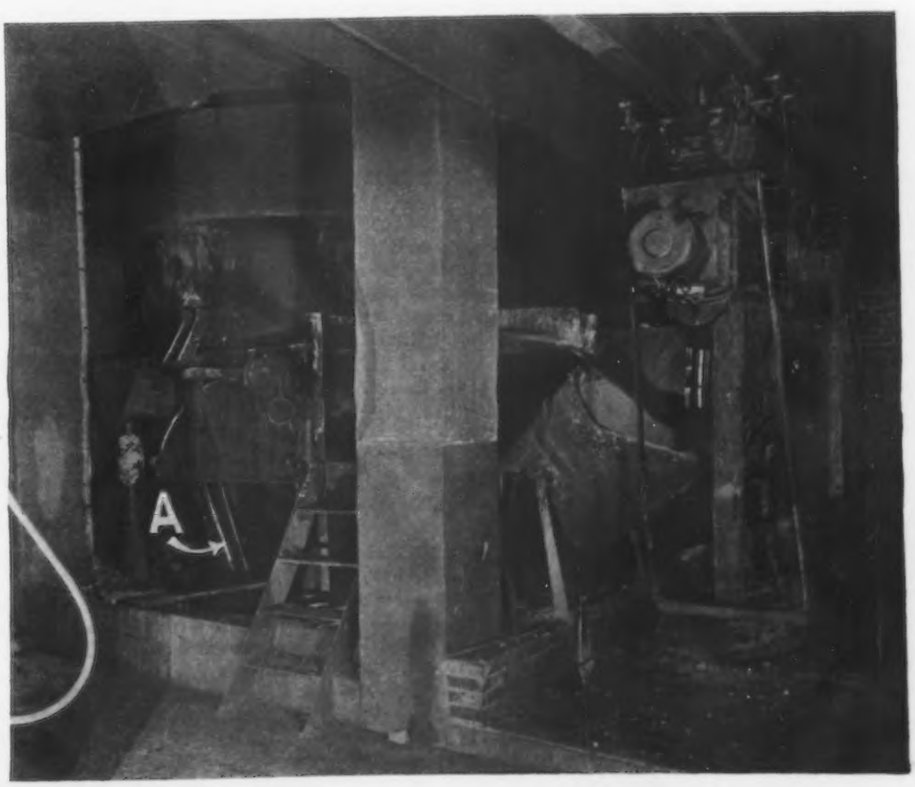


Fig. 4 — Spout Arrangement of Receiving Ladle and Trolley Ladle. Metal flows continuously from the cupola into the receiving ladle and is dumped intermittently into the man-riding trolley ladles, which pass in front of the cupola and then deliver metal to the floors. Slag drops through runner A to lower floor

as shown in Fig. 4. The receiving ladle is operated electrically, so that it gives very quick action.

Under the cupola at the back can be seen a leader (A) through which the slag from the slag spout flows down to the brick-walled drop room on the ground floor. The cupolas are located over 20 ft. from the ground level. Beneath the cupola floor is a mezzanine floor for storage of general foundry supplies. From the ground floor level to above this mezzanine floor is a steel shell, through which the cupola drop and the slag fall. The material is allowed to accumulate throughout the day and is cleaned up by the clean-up gang the succeeding day.

At the left of the stairs leading to the tapping platform is a chain hanging over a pulley. With a series of these pulleys and the chain the doors are lifted in place by means of a chain hoist.

A pig bed for receiving excess iron is located between the two cupolas. It is used at the beginning of the heat to take the first iron, which is used in warming the ladle, and at the end of the heat for taking the excess metal.

To distribute the metal, the man-riding monorail crane shown in Fig. 5 is used. These cranes were made by the Sprague division of the General Electric Co. Since they were built, the Shepard Electric Crane & Hoist Co. has taken over the manufacture of this equipment.

The man in the cab is in fixed relationship to the ladle, rising and falling as he controls the pouring of the metal into hand ladles at the various pouring stations. There are three of these pouring stations located on each side of the foundry, and at each pouring station are generally about four men. In this plant it is necessary to pour between 20,000 and 30,000 molds in 8 hr. (about 50 molds per minute). Nearly 100 tons of metal must be poured into these molds. From this it will be seen that the average amount of metal entering a mold is scarcely more than seven or eight pounds.

All pouring stations are raised above the general foundry floor level, so as to bring the pourers in proper relationship to the molds on the continuous carriers

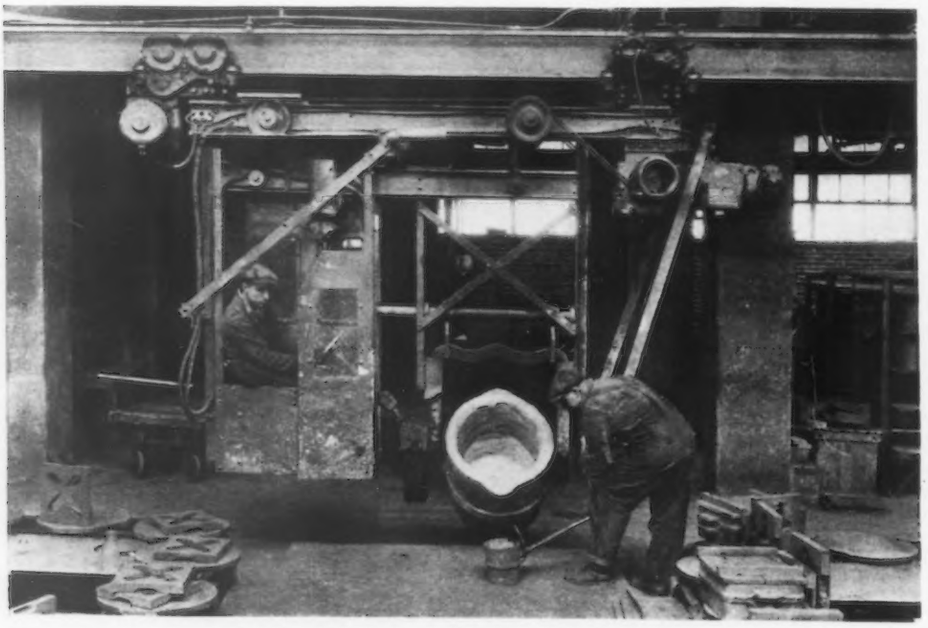


Fig. 5—Man-riding Trolley Ladle Pouring into Hand Ladles. At the pouring stations the floor is elevated to give the proper relationship between the men and the tops of the molds. The iron is delivered so that the pouring gang have very little walking

The monorail system on which the hot metal crane runs is on direct current and is equipped with electrically controlled glide switches. The man in the cage controls the switch ahead of him and thus does away with all manual control work.

Manganese Ore Production Decreases in 1926

Shipments of high-grade manganese ore, containing 35 per cent or more of manganese, from the mines in the United States in 1926 were slightly less than half as large as similar shipments in 1925, according to the United States Bureau of Mines. The shipments in 1926 by 45 producers amounted to 46,258 gross tons as compared with 98,324 tons by 42 producers in 1925. This decrease was due to the falling off of the shipments from Montana.

The domestic production of metallurgical ore in 1926 was 26,530 tons; that of chemical ore, 19,728 tons. Montana was the largest shipper with 5713 tons of metallurgical ore and 17,904 tons of chemical ore. The largest individual shipper of metallurgical ore was the Crescent mine in the Olympic Mountain region, Clallam county, Washington, from which the shipments for the year were 3162 tons.

The shipments of domestic ore containing 10 to 35 per cent manganese (ferruginous manganese ore) increased from 267,252 tons, valued at $915,316, in 1925 to 364,312 tons, valued at $1,179,429, in 1926. This increase is due to the larger production in Michigan, Minnesota and New Mexico. The domestic shipments of ore containing from 5 to 10 per cent manganese (manganiferous iron ores) were 835,412 tons in 1926, valued at $1,934,381, as compared with 1,153,268 tons in 1925, valued at $2,799,403. This decrease may be largely attributed to the elimination of the Wisconsin production as the manganese content in the ores shipped fell below 5 per cent in 1926.

Total apparent consumption of babbitt metal in April is reported by the Department of Commerce at 4,169,277 lb., the lowest figure in some time. It compares with 5,157,600 lb. in March and with 5,229,199 lb. in April, 1926. For the four months, consumption has been 18,877,360 lb., a considerable reduction from the 21,382,388 lb. of last year and the 21,618,506 lb. of 1925.

A specific demand for the reduction of the corporation income tax, backed by the business interests represented in the 1500 member organizations of the Chamber of Commerce of the United States, will be made upon the new Congress when it assembles next December. This move was decided upon at a meeting of the special committee on taxation of the Chamber, meeting in Washington.

World Electric Steel Output Less

Total Production of Leading Countries Has Declined Since the War—American and Italian Has Expanded—Little Progress in Electric Iron

BY EDWIN F. CONE

IT is a surprising fact that almost no progress, from a production point of view, has been made since the war in the world's output of electric steel. This is unexpected because, in total steel production, the volume for the world reached a new height in 1926—nearly 13,000,000 tons over the 1913 output.

The last analysis of the output of electric steel furnaces of the leading countries was made by the author in THE IRON AGE, Sept. 14, 1922, and covered the period from 1913 to 1921, including the war years. In the present article, the survey is brought up to date—through 1925, the latest detailed data available. The statistics used are almost entirely those published by the National Federation of Iron and Steel Manufacturers of London, England, and those of the American Iron and Steel Institute of New York.

Early Facts of the Industry

PRIOR to 1913 only two or three countries made any electric steel. As early as 1908 and 1909, steel was being produced in electric furnaces in Germany and France particularly, and in the United States. In 1913, when the industry really attained any magnitude, Germany was easily the leader.

The peak in production, up to and including the close of the war, was in 1918, when 1,149,660 tons was produced. This compared with only 169,700 tons in 1913—nearly a seven fold relation. Table I indicates this clearly.

Analyzing these data further, this table also shows that since the war there had been a decline up to 1925, when the world's total of 1,109,470 tons was almost 40,000 tons less than the 1918 figure. It is probable, however, that if the furnaces which were operating in 1918 as in Austria-Hungary are now in use in the reorganized territories, at least 40,000 tons is being produced so that the 1925 production was probably close to, or perhaps a little in excess, of that of 1918. No data for the missing furnaces seem to be available.

Several striking features stand out in the record. In 1913 Germany produced over 50 per cent of all the electric steel made in that year. The American industry ranked second, and it was then in its infancy. By 1918 the situation had radically changed. In that year the American output was about 17 times what it was in 1913, contrasting with a German increase of less than 2 per cent in the same time. In that year the American part was not far from half the total.

Marked Changes in Last Seven Years

IN the 7-year period from 1918 to 1925, some kaleidescopic changes have taken place. The American production reached its peak at 615,500 tons in 1925, though not a very large increase over the 511,300 tons made in 1918. German production has, of course, declined since the war—due probably to loss of territory containing steel works. The British industry has not only gone backward since the war but has stood still during the last three years of the 7-year period. The French industry has made substantial gains since the war—the 1925 output of 75,400 tons representing a 30 per cent increase over 1918.

In Italy the electric furnace steel industry has expanded about 300 per cent in the period since the war. Japan has shown about the same percentage growth. In Sweden also large gains have been made, though the country's industry as a whole has not yet regained its pre-war volume in either pig iron or steel.

Comparing 1925 with 1913 as a whole, the American production in the later year was about 55 per cent of the total; in 1913 it was about 18 per cent. Germany in 1913 made over 52 per cent of the total; in 1925 its part had shrunk to about 11 per cent. In 1913 there were 6 countries operating electric furnaces; in 1918 there were 9, with about the same number in 1925.

American Industry Has Striking Features

COMMENTS on the course of the electric steel industry in the United States have been made from time to time in the editorial columns of THE IRON AGE. A recapitulation here of the salient trends in output is worthwhile. Table II shows the output of electric steel castings of all kinds, electric alloy steel and electric alloy steel castings as well as the total production by electric furnaces.

In 1925 all records in American electric steel industry were broken. Besides the total output, a new high volume of electric steel castings was established—279,500 tons against only 9200 a dozen years previously and 108,300 tons as a war year output. Also a new total in electric alloy steel was reached in 1925

Table I.—Output of Electric Steel Ingots and Castings in the Leading Countries in Tons

	1925	1924	1923	1922	1918	1913
United States	615,512	432,526	515,872	346,039	511,364	30,180
Germany	125,000†	80,000	79,183	105,044	240,037	88,881
Great Britain	64,100	64,500	64,200	39,400	115,448	None*
Canada	9,843	6,163	8,932	12,005	119,130	449*
France	75,433	65,639	47,638	41,434	58,222	21,124
Italy	155,000†	142,553	176,611	117,810	46,878	None*
Sweden	42,588	37,552	17,695	17,234	13,089	2,276
Belgium	8,000†	7,870	8,110	930	.....	.....
Japan	14,000†	11,985	6,292	4,531	4,329	None*
Austria-Hungary	.....	.....	.....	.....	41,163	26,837
Totals	1,109,476	848,788	924,533	684,427	1,149,660	169,747

*Great Britain, 22,000 tons in 1915; Italy, 22,380 tons in 1915; Japan, 3,439 tons in 1917.
†Estimated. German electric and crucible steel total was 139,672 tons in 1925 and 97,756 tons in 1924.

at 293,800 tons. Most significant of all was the 44,400 tons of electric alloy steel castings made, or 100 times the production 12 years previous.

Pig Iron Made Electrically

ANOTHER development of decided interest is the manufacture of pig iron electrically. During the war this attained some magnitude. Two methods have been in use: Direct reduction of iron ore by electricity in the presence of coal or coke, and the synthetic conversion of scrap steel into pig iron or cast iron.

During the war Sweden, Norway and Italy led in production by the former process and France and Canada by the latter or synthetic process. Some was made during the war in the United States but the use of both processes here since has been virtually forced out by competition.

Table II—Electric Steel Output of United States
(Gross Tons)

	Total Electric Steel	Total Electric Steel Castings	Total Electric Alloy Steel	Total Electric Alloy Steel Castings
1913.....	30,180	9,207	.....	443
1916.....	168,918	42,870	71,129	926
1918.....	511,364	108,296	290,961	3,076
1920.....	502,152	155,196	245,572	11,710
1921.....	169,499	85,095	63,246	10,084
1922.....	346,039	154,982	125,419	17,760
1923.....	515,872	235,958	194,976	29,054
1924.....	432,526	206,549	188,563	28,821
1925.....	615,512	279,534	293,780	44,406

In the article in THE IRON AGE, Sept. 14, 1922, already referred to, a table was presented showing the production of this grade of iron by the five countries. The peak was in 1917 when about 150,000 tons was made, Italy and Norway leading with 67,000 tons and 56,500 tons respectively.

Since the war, so far as can be learned, only two countries have produced pig iron electrically, France and Italy. If Sweden and Norway are still producing, the data do not show it. The figures for France and Italy since 1922 are as follows in tons:

Manufacture of Pig Iron Electrically
(Gross Tons)

	France	Italy
1922.....	69,077	14,401
1923.....	78,284	15,704
1924.....	71,619	12,211
1925.....	40,506	24,500

The French production has declined in recent years but has exceeded each year any record previous to 1922. The Italian output is off from the war volumes.

General Observations

THE showing of the world's output of steel from electric furnaces since the war is probably explained by the fact that the cost of current has been the principal handicap. It is true that war conditions forced the industry to high output, cost being no consideration. If, however, the progress since 1913 is considered, with war production disregarded, the showing has been notable.

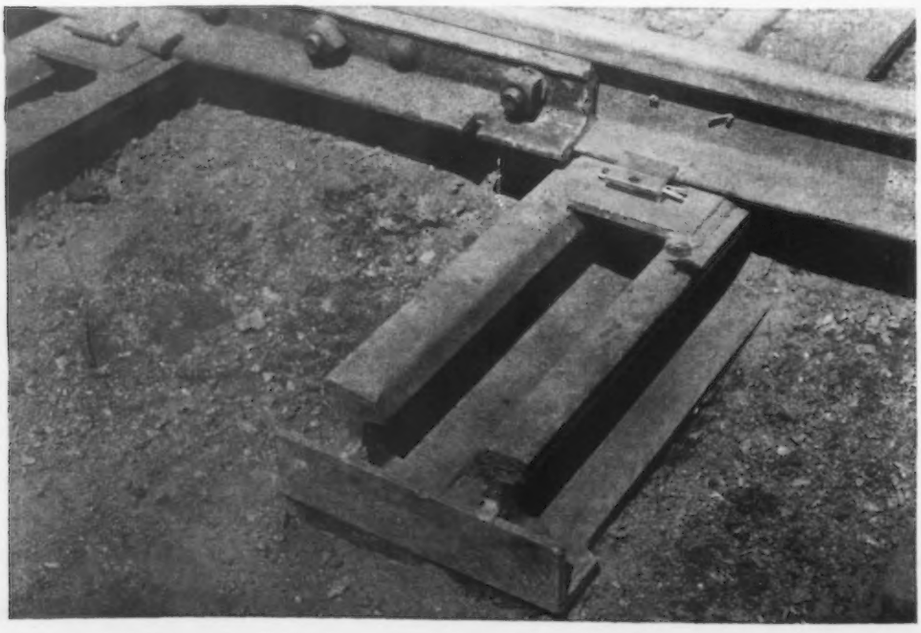
Railroad Ties Made From Scrap Material

STEEL railroad ties, constructed by electric arc welding from worn rails can be made at low cost, according to William Dalton of the General Electric Co. A number of sample ties were installed by the Delaware & Hudson Railroad about a year ago in its Glenville yards. The test has been so successful that Vice-President Loree has decided to undertake the substitution of metal for wooden ties in yards and sidings, and arrangements are now being made by that railroad company to install equipment for their construction.

Two pieces of rail are used for each tie—rail which has been removed from the roadbed as worn and with no value except as scrap. The two lengths are fastened together at each end by steel plates or angles welded in position. When two rails are fastened together in this manner, movement of the tie in any direction in the ballast is substantially eliminated.

For fastening the track to the tie, metal plates are welded to the tie and the track clamped to these with special clamping devices. As holes punched in the tie bars for rail clamps would destroy the efficient use of the bar material, separate plates fastened to the tie bar are used. As the edges of the tie plate are placed over the center of the top flange of the tie bars, the wave action of the rail throws the load directly over the webs of the tie beams, instead of on the outer edge of the flanges. This construction also serves to reduce the number of rail clamps to a minimum.

Analysis made by the Delaware & Hudson Co. shows a total cost of $2.80 for a wooden tie. The cost of fabricating a metal tie of the type described is 60c., and the scrap value of the tie material is $2.50, making an overall cost of $3.10. Inasmuch as the scrap value can be realized later, when the rails are discarded from tie service, the net cost of the metal tie, it is held, is reduced to the cost of fabrication.



TWO Short Lengths of Discarded Steel Rails with Steel Angles Welded Across Both Ends, Fashion a New Railroad Tie Which Is Said Not to Creep if Properly Ballasted. The rail fastening includes steel plates welded atop the new tie and special clamping devices

Ore and Fuel Cost Here and Abroad

American Coke Cheaper than European but Transportation and Higher Wages Make for Higher Raw Material Costs Here—Lowest in Luxemburg and Lorraine

BY PAUL M. TYLER*

QUALITY, prompt delivery, credit, habit, international friendships, sheer salesmanship, and even chance enter into the selling of steel abroad. In the last analysis, however, one of the chief determining elements is price. Since competition in steel exporting is keen, prices are likely to be dictated to a large extent by cost. And, since the European industry is largely overbuilt as compared with present-day demand, the marginal cost or price is likely to be so low that only the more favorably situated and the more efficiently operated plants can profitably sell steel in neutral markets.

Five basic factors in the plant cost of iron and steel are (1) cost of ore per unit of iron at the mine, (2) cost of coal or coke at the mines (or coke plant), (3) cost of the requisite fluxes at the quarry, (4) freight rates on each of these raw materials, and (5) labor cost at each step from ore to product.

From the standpoint of actual operating costs other factors have to be added to take account of the difference in managerial ability, in design of plants and in general plant efficiency. But these other factors are not inherent to a national industry. They are dependent upon the human element and not only (theoretically) can be rapidly equalized but quite naturally tend so to adjust themselves.

This tendency has been clearly demonstrated in recent years, as the former wide differences between American and European pig iron and steel-making equipment have become more nearly equalized. This is perhaps true more especially of steel works than of blast furnaces. But even in making pig iron, operators in Germany, and to a less extent elsewhere in Europe, either have copied American practice or have adapted it to their own needs. In fact, a fair number of foreign plants have been built or rebuilt under the direction of American engineers.

Conditions vary, however, in different lands. Fuel consumption per ton of pig iron made cannot be judged by the same standards in Birmingham (England) as, for example, in Pittsburgh, where the coke is better and where the furnace mixture contains so much more iron. Similarly in Belgium, where the plants have been almost wholly made over since the war, the engineers, though they followed American design in some cases, more often had to work out their own plans. The blast furnaces—partly because they are smaller and partly because they are run on a leaner burden—rarely melt more than about 300 tons a day.

Instead of charging by skips, bottom-discharge buckets seem to be preferred, on the grounds that they distribute the charge more evenly and waste less gas. Hand charging, at least at the principal plants, has been discontinued. Automatic weighing is employed for making up the charges, or the buckets are placed upon a scale car and run under the bins. At one Belgian plant, for example, charging the coke ovens and drawing the coke into skips for the blast furnace bins is reported as requiring "only one man per shift for each 10 tons of coal."

In making Thomas steel in 16 to 18-ton basic converters, the labor is only 3 man-hours per ton and in the rolling mill, including indirect labor, the averages are one man-hour per ton of blooms, 2 man-hours per ton of billets, and another 2 man-hours per ton of finished products (mostly rails and shapes). Ten man-hours per ton seems an accepted standard in Belgium to cover all labor in converting molten pig into finished steel.

The coke is better than that used in Alabama, but probably not quite so good as Connellsville coke. Even in Belgium, the fuel consumption is seldom less than one metric ton (2205 lb.) per metric ton of pig iron. And in Luxemburg, since the self-fluxing ore mixtures frequently amount to almost 4 tons per ton of iron, with a correspondingly excessive amount of slag to be melted, the average is over 1.1 tons, while in France it is probably nearer 1¼ tons per ton of iron.

Cheap Ore in Luxemburg and France

SINCE Belgium, Luxemburg and France all use principally minette ore from Lorraine and vicinity, the cost of the metallic mixture for the blast furnaces is mostly a matter of simple calculation based upon the price or cost at the mines. Various small additions are generally made to the smelting mixtures, and the furnaces closest to the mines generally use the leaner ores (30 per cent or less), whereas those farther away use ore averaging as much as 35 per cent iron. But these minor matters need not be considered in our present rough analysis of elementary factors.

Practically all qualities of minette ore have been cheaper since the war than before. But, following the virtual stabilization of both French and Belgian exchange, the price has tended slowly to rise, with the result that the export price seems likely to remain around $1.50 (United States currency) for the best grades. Home prices, of course, are lower. Since the production is officially reported at 10 metric tons per man per day, the labor cost at the mine-face is only 8 or 10c. a ton and even now, at most mines, the total production cost is substantially less than $1 per ton.

Since the French iron industry is located virtually at the mines, this also represents its ore cost, except for switching charges. The three tons of ore required to make a ton of pig iron would cost something like $3.40 at typical furnaces in the Eastern district of France. An even lower figure may be used for Luxemburg, but for Belgium, since the ore must bear a freight charge of 90c. a ton, the total ore cost at the furnaces works out at about $6 per metric ton of pig iron.

In Germany the choice of ores is more varied, ranging from this same low-grade minette and sundry domestic ores, the latter carrying about 40 per cent iron, up to the Swedish ores some of which carry as much as 66 per cent. Ores are imported from Spain and North Africa also, and some from Newfoundland, Normandy and other places. With so many different sources to choose from, the Ruhr ironmasters find it profitable frequently to change their ore mixtures.

If any one ore can be taken as representative, however, it is Swedish. A rough calculation from data in the financial statement of the leading Swedish mining company indicates that the average cost of this ore is under 40c. per ton, but the best or low-phosphorus grade (A) has been priced lately at $4.20 (15.75 Swedish crowns) per metric ton f.o.b. Narvik, Norway. To this must be added ocean freight of $1 or $1.25 to Rotterdam (1320 kilometers or 820 miles) and Rhine barge freight of 15 to 20c. to the furnace docks, thereby bringing the total cost c.i.f. Ruhr works around $5.50 per ton of 60 per cent ore, or 9c. per unit of Fe.

Medium and high-phosphorus ores are cheaper, say 8c. per unit or about the same as the delivered price

*1817 Thirty-seventh Street, N. W., Washington.

for minette which, since it requires more coke and cuts down furnace capacity, apparently is not considered so economical.

Spanish ore (containing 50 per cent iron and including both rubio and calcined spathic) could be obtained in the middle of 1926 for about $3.90 (16s.) a gross ton free on Rhine barge at Rotterdam. But increased ocean freights resulted in a price of $4.86 (20s.) in January of this year. Including barge freight, then, the normal ore cost per ton of pig iron made from Spanish Rubio is $8.70 or less. However, in Germany as elsewhere on the Continent, much of the Spanish and North African ore is used for mixing with Swedish ore. And since its function is not merely to provide a suitable amount of slag but also to regulate the phosphorus, it is not always replaceable by Lorraine ore—even though the latter should become very much cheaper. (a)

Fuel Situation Handicaps British Mines

The British industry uses a much larger amount of Bilbao ore and not so much Swedish. Rubio, the best quality, has been quoted recently at $5.35 (22s.) per gross ton, or about 10½c. a unit at Middlesbrough, thus making it a rather costly ore to use. As compared with plants in South Wales, where there are no local iron mines, or even with those in Middlesbrough, where the deposits are much depleted, inland furnaces employ a much larger proportion of native ores, some of which are as cheap as 1d. (2c.) a unit. In fact, the average reported mine value for all the low-grade ores (averaging 27 per cent Fe) before the strike in 1926 works out to 3.3c. per unit at the mines, most of which are fairly close to the furnaces.

The fuel problem has tended recently to offset the relative cheapness of local ores and to encourage the use of higher grade, imported ores. The prejudice of British engineers with respect to basic steel is another factor that has tended to delay the opening up of low-grade deposits of these ores, most of which are moderately high in phosphorus. English hematite ores (Barrow-in-Furness) cost about the same as Rubio.

Table I is an attempt to simplify a rather complex problem into a set of figures which will indicate the relative position of the leading districts with respect to ore costs. No account is taken of the fact that the basic iron made in Pittsburgh is an entirely different product from the Thomas iron made in Lorraine or Belgium. Moreover, the latter quality of iron calls for an admixture of a small amount of manganese ore, for which no allowance has been made in the present estimates. Even in the Lorraine field will be found plants which, though more or less adjacent to one another, are smelting ore mixtures considerably lower or a trifle higher than those which the writer considers as typical for the district as a whole. Further confusion arises because some companies mine their own ore while others buy it, sometimes nearby and sometimes from a considerable distance. The addition of scrap to blast furnace charges likewise had to be ignored.

It is believed, however, that in a general way Table I provides a fairly faithful picture of the situation. In particular, it focuses attention upon the tremendous advantage of plants situated close to the mines from which they get their ore and the corresponding handicap of those farther away, even though they may be well situated for receiving sea-borne ore.

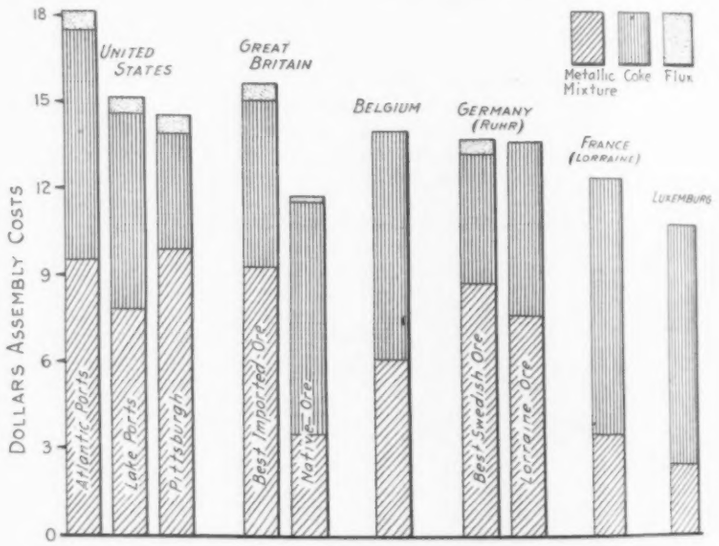
Fuel Situation Much Simpler

WITH respect to fuel the situation is far less complicated. In Europe, since the main sources of coking coal are in Westphalia and in Great Britain, prices elsewhere are governed largely by the cost of delivery from one or other of these centers. The normal balance between German and British fuel, however, is still badly upset by reason of the fact that the British coal mining industry has not yet demonstrated its ability to agree within itself to face the facts of post-war conditions. For a long time after the war, labor troubles proved serious also in the Ruhr, but they were eventually adjusted. With the help of better management and more up-to-date equipment, general efficiency has improved and the Ruhr output per man is one-sixth greater now than in 1913.

Following the recent strike settlement, efficiency has shown substantial improvement even in England in a few localities, notably in Durham, the important coking coal district. Nevertheless the future of the British iron and steel industry, since it so largely depends upon the extent to which coal mining recovers the ground it has lost, is still in doubt. British coke prices, which ranged from 18s. 6d. to 21s. 6d. ($4.50 to $5.25) per gross ton before the strike (or about the same as pre-war), are somewhat higher now. German coke is also higher, costing about 21 marks (a trifle under $5) per metric ton as compared with 17.50 marks ($4.15) in 1913.

German Coke in France

Westphalian coke, the dominant factor in the French supply, comes into France partly as regular imports and partly as reparations deliveries. The price is that at German ovens plus freight which, since last September, amounts to 9.25 marks to Sierck, the railroad point at the frontier, or about 10.40 marks ($2.50) to Lorraine furnaces. The delivered cost, therefore, works out to about $7.50, the price in French currency ranging around 200 francs per metric ton. The price across the



Assembly Costs of Blast Furnace Raw Materials in the United States and in Five European Countries. It will be noted that the self-fluxing ores used in Belgium, France and Luxemburg and, in part, in Germany, avoid the flux costs shown elsewhere. Ore costs, influenced heavily by carriage charges, show wide variations, as is the case also with coke

(a) Typical quotations in early 1927 for German delivery are as follows: Minette, Alsace-Lorraine (32 per cent Fe), 5.75 to 6 marks at border; Minette, Briey (basis 35 per cent Fe), 40 French francs at mine; Lorraine, calcareous (20 to 22 per cent Fe), 15 French francs at mine; Luxemburg ore, 250 Belgian francs at mine; Siegerland, spathic, natural condition, 13.65 marks, mine; Siegerland, calcines (basis 46 per cent Fe, 8 per cent Mn), 18.25 marks, mine; Nassau red ore (42 per cent Fe, 28 per cent SiO_2) 8 marks at mine. Sea-borne ores are quoted as follows, free on Rhine barge, Rotterdam: Normandy ore (45 to 50 per cent Fe), 13s. to 14s. 6d.; Morocco ore (60 per cent Fe), nominal 18s. to 20s. per gross ton; Rubio (50 per cent Fe, 8 to 10 per cent SiO_2) 19s. to 20s. per gross ton; with Algerian ores usually a little cheaper and other Spanish ores 2s. to 3s. cheaper.

border in Luxemburg is about the same as in Lorraine.

Belgium, however, makes a large part of her own coke, although mostly from German coal. The larger steel works have their own ovens but there is a fair amount of coke sold, the price having risen during 1926 until recently it has been hovering around 250 Belgian francs, or about $7 per metric ton.

Combining the prices of coke with those for ore and flux, and making appropriate allowances for coke consumption and transportation charges in the several countries and for the different types of ore, the raw material costs per ton of iron may now be summarized as in Table II.

Freight Charges Dominate American Costs

Comparisons in Table II take account of transport charges both by rail and by water. In the United States, where ore may travel as much as 1000 miles and fuel often 50 miles or more, these charges are more burdensome than in other leading iron and steel producing countries. The average haul in Great Britain is scarcely 10 miles; some of the best-known British plants are situated at seaboard and those employing native ores are within a mile or two of the mines, the ores being carried on private railroads. On the Continent, much of the pig iron output comes from furnaces situated either at the ore mines or at the coal pits. Freight, therefore, ordinarily forms a much smaller part of the cost of making pig iron than it does in the United States.

Total assembly costs as calculated by the present writer from actual furnace mixtures in the different domestic districts ranged in 1923 from $1.95 in Alabama to $8.65 in Eastern Pennsylvania plus, in the latter instance, the ocean freight on imported ore.(a) At present, the average for the United States is probably between $7, the cost at Buffalo, and $8, the cost in the Valleys.

As a general rule, cheap pig iron means cheap steel, especially in its semi-finishd forms. Nevertheless, assembly costs for pig iron are not the only transportation charges borne by steel. The product must be carried to its final destination and there are also various items, including fuel and supplies, that must be carried to the steel works before the iron can be transformed into finished products. Ordinarily, "ore goes to coal," but only because the market is generally larger in the vicinity of the coal mines than near the ore fields.

Foreign transportation costs, since they affect so materially the ability of American exporters to compete in neutral markets, will be described in detail in a later article, which will take up also the matter of relative wages and labor costs.

(a) THE IRON AGE, Jan. 6, 1924.

Table I—Cost of Ore in Leading Districts, Metric Tons

Locality	Price Per Ton of Ore Plus Freight	Iron Contents (Basis) Per Cent	Approximate Cost of Ore Per Ton of Pig Iron(a)
United States:			
Lake ports	(b)$4.25	51.5	$7.85
Pittsburgh	(b) 5.35	51.5	9.90
Atlantic ports (c)	various	various	9.50
France—Lorraine	1.15	32	3.40
Luxemburg	.75	30	2.40
Belgium	2.00	32	6.00
Germany—Ruhr:			
Best Swedish ore	5.50	60	8.70
Lorraine ore	2.55	32	7.60
Great Britain:			
Best imported ore	4.90	50	9.30
Native ore	1.00	27	3.50

(a) Calculated on basis of 95 units Fe.
(b) Based on average price in 1926 of $4.30 per gross ton at Lower Lake ports.
(c) Purchased foreign ore only.

Table II—Raw Material Costs Per Metric Ton of Pig Iron in Various Countries, in United States Currency

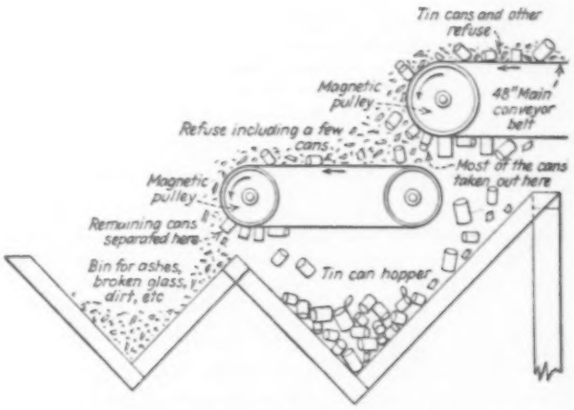
Locality	Metallic Mixture(a)	Coke(b)	Flux	Total
United States:				
Lake ports	$7.85	$6.75	$0.50	$15.10
Pittsburgh	9.90	4.00	0.60	14.50
Atlantic ports	9.50	8.00(c)	0.60	18.10
France—Lorraine	3.40	9.00	...	12.40
Luxemburg	2.40	8.40	...	10.80
Belgium	6.00	8.00	...	14.00
Germany—Ruhr:				
Swedish ore (best)	8.70	4.60	0.40	13.70
Lorraine ore	7.60	6.00	...	13.60
Great Britain:				
Best imported ore	9.30	5.75	0.60	15.65
Native ore	3.50	8.00	0.20	11.70

(a) Based upon 95 units Fe in ore.
(b) Coke consumption estimated at 2000 lb. for Spanish, Swedish and domestic ores, up to 2700 lb. for lowest grade ores.
(c) This figure will vary greatly, according to method employed for allocating freight on coal to coke or by-products.

Magnetic Pulleys Remove Tin Cans from Non-Combustible Rubbish

Los Angeles sells its non-combustible domestic rubbish to a by-products company which separates the ferrous material from the non-ferrous by the use of magnetic pulleys. While this method is common practice in many places, the details of the duplex arrangement in the Los Angeles plant make it a little unusual. Our description is from a general account of the plant as a whole, published recently by *Engineering News Record*.

As will be noted from the diagram, the tin cans and other refuse are carried on a 48-in. main conveyor belt, the discharge end of which passes over a magnetic pulley. This takes out most of the tin cans and other ferrous material from the mass of refuse. Some of these



Two Magnetic Pulleys in Series, to Remove Tin Cans and Other Iron and Steel Materials from Rubbish

items, however, drop on to the second belt, along with the great mass of non-ferrous or non-magnetic material. Hence, a second magnetic pulley at the discharge end of that belt is relied upon to remove the remaining cans. The hopper is so arranged that cans from both pulleys drop into the same receptacle.

Among the monthly amount of reclaimed materials are an average of about 600 tons of tin cans and 175 tons of miscellaneous metal, from which combustible material is lightly burned off. The metal is then compressed into bales. This miscellaneous metal, known in the yard as "riff raff," is taken off the belt by hand, three pickers being employed. Items in this class include wire, stove pipe, screens, fencing, oil stoves, galvanized iron, etc. Granite iron utensils, picked off at this stage, are later hauled to the dump, as no economical salvaging means for granite iron-ware has been found.

A motion picture film entitled "This Is the Age of Riveted Steel" has just been issued by the Hanna Engineering Works, 1765 Elston Avenue, Chicago, and is available for showing by technical societies, schools, industrial shops and other groups interested in riveting. The picture illustrates in detail the production of rivets, steel building and bridge fabrication, the construction of railroad equipment, automotive chassis frame production and boiler manufacture, emphasizing the rivet's contribution to the progress and safety of humanity.

Jobbers' Problems Dominate Meeting

American Steel and Heavy Hardware Association Threshes Out Questions Relating to Mill Competition, Profits, Delivery Charges and Small-Lot Orders

VARIOUS problems that the jobber faces in the distribution of steel products, particularly the one of mill competition for small lots and that involved in the jobber being called upon to fill orders so small that they are not desirable, were discussed at the eighteenth annual convention of the American Steel and Heavy Hardware Association at the Hotel Cleveland, Cleveland, May 23 to 25.

This was the first meeting of the association since its change of name from the American Iron, Steel and Heavy Hardware Association. By coincidence another group of distributers in the iron and steel industry, the Metal Branch of the National Hardware Association, was confronted by many of the same problems at a meeting in the same hotel three weeks before. An improvement the past year in the distribution situation with respect to bolts and nuts was reported and discussions indicated that better conditions for the wholesaler might result from closer cooperation with manufacturers.

In his opening address the president, G. K. Conant, Sligo Iron Store Co., St. Louis, reviewed conditions briefly and said that the jobbers as a whole had been fortunate the past year in that the prices on most commodities which the members of the association handle had been more or less stable.

Bolt and Nut Industry Has Corrected Some Evils

A bright picture of marked improvement in the condition of the bolt, nut and rivet industry, brought about by the efforts of the Bolt, Nut and Rivet Institute, was presented by Charles J. Graham, president of that institute, who also outlined some of the still existing difficulties, among which are the problems of selling and getting fair profits.

"Two years ago when I talked to you at Detroit," said Mr. Graham, "we were just getting under way to correct the evils in our industry. Now I can report progress. We have tried to build up an industry that had dropped down into the gutter about as far as any industry could go. We wanted to correct the existing evils and do constructive work. We have given the subject of costs more consideration the past two years than ever before and this has brought out some startling conditions."

Mr. Graham referred to the successful efforts of the institute in proving to the railroads that regular manufacturers could produce bolts, nuts and rivets at lower prices than the railroads could make them. Similar efforts were made among some of the larger consumers in the industrial field and he said that the results have been gratifying. Several of the railroads, including the New York Central, have discontinued the manufacture of bolts, nuts and rivets, and the Pennsylvania Railroad has cut down its output and will discontinue the manufacture entirely. In the industrial field several of the large manufacturers of railroad cars have discontinued making their own bolts, nuts or rivets.

New Price Lists on Bolts and Nuts Based on Costs

Taking up the new price lists on bolts and nuts that became effective April 1, Mr. Graham declared that there had heretofore been no lists based on costs and that the present lists are the only lists ever made that are fair to the manufacturer, jobber and consumer. The prices on these lists are based on machine hour rates. While the lists had brought some criticism, he did not think it justified. Jobbers have criticized the 10 per cent extra for broken packages, but he said that less than 1 per cent of what the jobbers handle will be affected by the broken case lot prices. This extra, he said, would throw back to warehouses business that has been going to the manufacturer. The jobber should pass it along to the buyer as is intended. The institute, he said, is now working on plans looking to the standardization of bolt head and nut sizes by all manufacturers. The manufacturers are now trying to put the jobbers in a position to handle bolts and nuts at a profit. Price competition is the death of trade when carried to the extent that it has been, he declared.

Costs of Distribution Still Too High

Turning to the subject of the cost of distribution, Mr. Graham said that this is higher than ever and jobbers have not given enough attention to it. Causes of the increase included small-lot orders and deliveries by motor truck. A great problem in all industries is lack of profit. Any opportunity that manufacturers and jobbers can find to increase profit will have the same general effect on the prosperity of the country as high wages for labor. Various Government agencies are now cooperating with industries, Mr. Graham said.

"We have had fear of the Federal Trade Commission and other Government agencies," he said. "The men in the Department of Justice and the Department of Commerce as at present constituted are there to help and not hinder. There are ways that are legal of stabilizing industries and prices. We are proud of what we have accomplished in stabilizing the bolt and nut industry and in doing it we have done nothing illegal. The Federal Trade Commission as constituted today is there to help industry to make a reasonable amount of profit."

Selling Problems Not Yet Solved

Another great problem in all industries today is that of selling, declared Mr. Graham. This problem should be studied by all the basic industries. Salesmen are their own worst enemies. Manufacturers should determine costs, fix prices based on these costs and stick to them. If the manufacturer does not give the jobber proper protection, the latter should cease doing business with the offending producer. In order to further improve the conditions in the industry and the relationship between the manufacturers and jobbers, Mr. Graham stated that he planned to cover the whole United States with the program that has been mapped out. Jobbers will be visited in all the leading centers. One of the main things that it is hoped to eliminate is direct shipment from manufacturers to consumers on jobbers' orders. Jobbers should carry stocks and ship from their stocks. Efforts will be made to induce jobbers to buy on the basis of quality and service instead of only on the basis of price.

In the discussion doubt was expressed as to whether small manufacturers would cooperate in efforts to correct the existing evils in the industry. Mr. Graham replied that it was not an institute matter, but involved the industry as a whole. No agreements of any kind would be entered into, but he is satisfied that while they would not get 100 per cent support, they would make a good start and finally secure the support of 90 per cent of the jobbers and manufacturers.

Delivery Charge for Small Lots is Urged

That a delivery charge be made on small lots was urged by G. M. Congdon, Congdon & Carpenter Co., Providence, R. I., in a discussion of ways to make the steel and heavy hardware business more profitable.

His company, he said, had adopted a delivery charge of $2 a ton on steel bars and made a minimum cartage charge of 50 cents. The result is that deliveries by its warehouse are reduced and the company gets a fair return for the small lots it does deliver. To make the plan work a jobber must have the cooperation of his competitors in the same city, for one cannot make a delivery charge if others deliver free. The extent to which some jobbers are making long distance deliveries is suicidal, he declared. One speaker suggested that the jobber was rendering too much service to the customer and said that profits could be increased by reducing the service.

Another view of the matter of service was taken by William R. Batty, Standard Nut & Bolt Co., Valley Falls, R. I., who held, in discussing the question as to whether emphasizing price rather than service is not largely the cause of the unprofitable conditions of business today, that if jobbers gave more attention to service they might get better prices.

Jobbers in heavy hardware are filling in the gaps caused by the sharp decline in the demand for blacksmiths' supplies by handling automobile parts and supplies, drilling equipment and welding equipment. This was brought out in the report of the heavy hardware committee presented by C. C. Dodge, George F. Blake, Jr. & Co., Worcester, Mass. However, he said, there is still enough demand for blacksmiths' supplies to warrant jobbers in carrying fair-sized stocks. The sale of horseshoes, he said, has declined about 33 per cent during the last five years. In a later discussion of the sales outlook in respect to horseshoes and horseshoe nails A. W. Sexsmith, vice-president Phoenix Horse Shoe Co., Chicago, declared that horseshoe sales are falling off at the rate of 5 per cent a year.

The making of an interest charge by jobbers on past due accounts was favored by H. A. Sadler, Sioux City Iron Co., Sioux City, Ia. He said his company makes these charges and is able to collect 95 per cent of them. However, others seemed to think that jobbers would have a hard time collecting interest charges from customers.

A plea for definite legislation that will legalize resale prices was made by S. L. Orr, Orr Iron Co., Evansville, Ind., chairman of the committee on national legislation affecting trade relations. While the courts have upheld resale prices, he declared that it is almost impossible to exercise that right, which is granted under the Sherman Anti-trust Law. Manufacturers maintain fairly uniform prices but competitive conditions result in demoralized resale prices. In his opinion competition and the law of supply and demand would prevent unreasonable prices by distributers were resale prices generally in effect. He also strongly advocated the reduction of the income tax on corporations by Congress during its next session.

Foreign Steel Competition Declared Over-Emphasized

The competition of mills for less than car lots is a real menace to the warehouse business, declared E. J. McCarthy, Beale, McCarthy & Rogers, Inc., Buffalo, in his report as acting chairman of the iron and steel committee. He read letters from other members of the committee located in various sections and nearly all complained that mills took business that should go to the jobbers. From jobbers along the Eastern coast also came complaints of the competition of foreign steel. The hand-to-mouth policy of buying by consumers had helped jobbers to some extent, he said.

The subject of imported steel was discussed by G. M. Congdon, who believed that the menace of foreign steel is not as great as some think. He said that in Providence the shops want high quality steel for machine shop purposes and jobbers there do not seriously feel the effects of foreign competition. They are protected to some extent by a 24 cent freight rate on foreign steel from Boston to Providence. In Boston, he said, the foreign steel used is mostly structural material and deformed bars. The foreign material lacks uniformity in rolling. In his opinion it is a good plan for jobbers to handle only steel of a certain established analysis. The sentiment was voiced that the foreign steel situation should be met with a challenge to use American products and that it is not fair to American mills for jobbers to go back on them and buy imported material.

An unsatisfactory situation exists in the cold finished steel market according to the report of the chairman of the committee on this product, A. J. Lockwood, Edgar T. Ward's Sons Co., Newark, N. J. He complained that small dealers were able to get quick delivery from mills located in their near vicinity and this hurt the business of warehouses that carried large stocks. He also found a tendency among the mills to do a warehouse business.

Jobbing Industry Should Be Put on More Efficient Basis

Declaring that merchandising has become the problem of today and that the jobber is an indispensable factor in the distribution of steel and performs a service that the manufacturer cannot dispense with, Charles F. Abbott, executive director of the American Institute of Steel Construction, New York, submitted a program for improving conditions in the jobbing trade. Too many jobbers, he said, are operating under the scheme of yesterday and are not keeping abreast with the times or up to date in their sales organizations. Talk about eliminating the jobber is a waste of effort. Those that sell direct have to perform a service that is done by jobbers. Usually when a manufacturer sells direct the jobber has ceased to function properly and if the jobber would function properly there would be less direct selling. The fundamental duties of the jobber are to assemble and store material, maintain an adequate sales force, ship products to customers when wanted and in the quantities wanted and carry accounts and make collections.

Mr. Abbott declared that there are horse trading methods in the sale of steel that must be wiped out. The producer should name a sales price and protect the jobber, working with him instead of against him. Jobbers cannot expect mills to turn over large orders to them. In all lines buyers buy direct from the manufacturer. A jobber should intensely exploit his lines among small consumers. Jobbers may not be stocking all lines they might sell. They should develop markets and adopt more efficient methods of distribution. Mr. Abbott offered the following program for improving conditions and correcting evils in the jobbing industry:

> The entire industry should be organized on a more sound basis.
>
> Assessments should be authorized to raise funds to carry on association work.
>
> Market research should be initiated.
>
> A code and standard practice should be prepared.
>
> An educational program should be adopted and put in effect.
>
> The use of domestic steel should be promoted because of its superiority to foreign products.
>
> Advertising and sales promotion work should be carried on.
>
> A one-price policy should be adopted.
>
> A uniform system of cost accounting should be kept in effect.
>
> The relations between mills and jobbers should be improved.
>
> Engineers should be engaged that the association might become an authority on the combination of noncombustible materials with steel in residence construction.
>
> Vital information and statistics should be compiled and made available to the members.
>
> An able man should be employed to execute the entire program.

Small-Lot Orders a Problem

The small order problem was discussed at some length and a difference of opinion was expressed as to whether jobbers should charge an extra for small lots. E. P. Sanderson, E. P. Sanderson Co., Boston, declared that small orders cannot be handled without a loss and that the situation is getting worse. The only remedy he believed is to have a higher price for small lots. He said this is a very vital problem, particularly in the heavy hardware supply business, and unless a fair price is charged something must be done to eliminate the small-lot business. W. E. Hansen, Hansen & Yorke Co., Inc., New York, held that the small orders are a phase of the business that jobbers have to contend with and he saw no way out of it. He declared that a price differential for small lots would not work, as this would drive business to dealers who do not charge the extra. He pointed out that jobbers' orders are largely made up of small lots and that many of the

small-lot orders often come from customers who often buy good sized lots. Some complaint was made about small-lot parcel post business, which was pointed to as a growing evil. E. J. McCarthy said that his company caters to small customers and that business of these customers amounting to $250 or less per month does not vary much in periods of depression, while orders from large customers usually fall off sharply. The only remedy suggested for stopping mills from making small-lot orders was for the jobbers to convince the mills that they should not take these orders.

The bolt and nut committee, through its chairman, W. E. Hansen, made a report on what is being accomplished in improving conditions in the bolt and nut business by establishing better relationships between the jobbers and manufacturers. The meeting attended by the jobbers east of Chicago was held by the bolt and rivet manufacturers in Pittsburgh, Jan. 31. At that meeting a jobbers' committee was appointed to work with the manufacturers and devise plans that would be agreeable to all sections of the country. Recommendations were made that protection be given to the distributers. The manufacturers agreed on an extra for broken cases and kegs and also agreed that they would not take orders from distributers who do not carry stocks. The new plan, Mr. Hansen said, is working remarkably well in New York City and he thought the jobbers in other sections should get together along the same line and demand cooperation from the manufacturers.

The situation in respect to the marketing of twist drills, taps and dies was declared to be similar to the bolt and nut situation and efforts to eliminate the mill competition on these products will probably be considered at the next meeting.

A tabulated report on the cost of doing business was submitted by C. Stuart Tobin of the committee on that subject. This indicated a slight reduction in the total cost of doing business the past year, being $26.62 per $100 in 1926 as compared with $27.49 in 1925.

Charles E. Adams, president Cleveland Hardware Co., Cleveland, discussed general business conditions and predicted that various mergers would be brought about during the next few years as a result of present keenly competitive conditions.

Eugene McK. Froment Elected President

Eugene McK. Froment, Froment & Co., New York, was elected president for the ensuing year and H. A. Sadler, Sioux City Iron Co., Sioux City, Iowa, was elected first vice-president. They had been first and second vice-presidents respectively. Mr. Froment succeeds G. K. Conant, Sligo Iron Store Co., St. Louis. Two new members of the executive committee were elected for a three-year period. They are W. J. Holliday, Jr., W. J. Holliday Co., Indianapolis, Ind., and R. H. Welton, Chase Parker & Co., Boston.

Boston was selected as the place for the next convention in May, 1928. As no other city entered into competition the selection was made by the members instead of being referred to the executive committee for later decision.

Railroads Adopt Standard Classifications of Scrap

Purchases and Stores Division of American Railway Association Agrees on Definitions Adopted by Department of Commerce

CHICAGO, May 31.—Recommendations to revise and coordinate railroad scrap classifications with the standard classification advocated by Department of Commerce were adopted here on Thursday of last week at the annual convention of the purchases and stores division of the American Railway Association. With this action taken by the railroads entire uniformity as to scrap classification is assured. The new classifications were adopted, it was stated, only after thorough consultation with scrap dealers who, with steel makers and others, have approved them in conference with the National Committee on Metals Utilization, Department of Commerce. The decision of the railroads to change to the standard classifications, it was declared by the committee, will result in substantial savings.

The action taken was a part of a broader program of the purchases and stores division for extension of the scope of standardization and simplification of materials as a further means of bringing about still greater economy and efficiency in the operation of the railroads. The convention also adopted recommendations made in a report that a joint committee representing the purchases and stores division and the mechanical division of the association review scrap reclamation problems of interest to each division and the railroads at large with a view to increasing reclamation work.

The report on standardization and simplification said that simplification of stores stocks by reducing the number of items is productive of numerous economies, among which are: More economic purchases due to a smaller number of items ordered, eventual reduction in manufacturing costs of various items and elimination of special material which involves higher prices; more economy in bookkeeping and better control of stocks; smaller stock balances, and less storehouse space and consequently more convenient and economical arrangements of stock.

"Numerous roads," said the report, "have already adopted plans looking to this end but the committee feels that this work can be extended so as to include a larger number of parts for mechanical and other appliances. At the termination of Federal control, for instance, the total number of items of material and stock on the Pennsylvania Railroad approximated 150,000. This number has been reduced to 63,300. This is representative of what other roads are also doing in that respect. One railroad by making a systematic study of certain items has been able to eliminate 24 sizes of copper tubing; 18 sizes of brass tubing; 93 sizes of cold-rolled steel tubing and 1289 fabricated steel car parts. The stock investment savings on the steel car parts alone is approximately $43,000 based on normal quantities previously carried compared with what is now carried. There is a field for study in parts for mechanical and other appliances.

Old Material Utilized in Various Ways

In announcing progress made in reclamation work, the purchases and stores division said that through the work as now being conducted by the railroads of the country some use is made of practically every bit of old material just as long as it is possible and economical to do so. As indicative of the extent to which this work is being conducted, it was stated, old metallic roofing and empty powder or carbide cans are converted into tin buckets, cups and other tinware, while old broom handles and other mill refuse are made into staffs for signal flags such as are used extensively by the railroads. Scrap locomotive tire steel is being converted into hammers, while even old hose is being used for the manufacture of baggage mats. Broken leaves from springs are made into elliptic springs. Flues, which can no longer be used in locomotive boilers, are flattened and made into washers. Bolts are straightened and re-threaded, second-hand rail made into guard rails, and car wheels which have become flat are again made available for use by grinding.

The stationery and printing committee reported remarkable savings by use of standard forms and made recommendations for other savings in this class of material. Among other things the committee urged the more restricted use of common pins and the limitation of the pins used to one size. One of the large railroads using about 13,000,000 pins annually has reduced by $1,500 the annual purchase of pins.

Economics of the Five-Day Week

Social Aspects of Question Not the Dominant Factor—Foreman Education Also Discussed at Convention of Industrial Engineers

DISCUSSION of the five-day week was a feature of the fourteenth annual convention of the Society of Industrial Engineers, held at the Hotel Stevens, Chicago, May 24 to 27.

The major subject of the meeting was "The Principles of Effective Management and Their Relation to Industrial Engineering." A number of papers relating to the management principles and technique was presented and a feature was the birthday dinner party held to celebrate the tenth anniversary of the society. Following the dinner, a one-act play entitled "Wotta Life," a satire on a "five-hour" week, was presented by the Chicago chapter of the society.

Dr. W. F. Rittman, head of the department of commercial engineering, Carnegie Institute of Technology, Pittsburgh, was reelected president of the society, and George C. Dent, 608 South Dearborn Street, Chicago, continues as executive secretary.

Some Considerations in Reducing Working Time

Facts in the case for and against the five-day week, as summed up by Arthur H. Young, Industrial Relations Counselors, Inc., New York, are as follows:

(1) Both wages and profits have to be paid out of what is produced in industry.

(2) With hours of labor already reduced to probably little more than half the average of those of a century ago, it is fair to conclude that the employer under normal circumstances is under no more obligation to reduce the working week below the present standard of 48 or 44 hr.

(3) It will need to be determined whether or not it is more economical from the standpoint of overhead cost to run a plant for a half-day on Saturday, or to shut it down and save the expense of power or labor and other items.

(4) The argument based on the purchasing power of labor and the business effect of an additional day of leisure involves some of the most complicated series of economics. Upon these series, there is little hope of agreement among either economists or industrial managers.

(5) The question of further reducing the working time of American labor is dependent in the main upon considerations that are practical and economic, not social, political or religious. Blind advocacy and unreasoning opposition are equally futile in reaching the true solution. It is a subject that ought to be approached not in prejudice or belligerently but in a scientific spirit and with an open mind.

A brief summary of Mr. Young's paper follows:

We will be helped in a business-like and unemotional approach to our subject if we recall our history and remind ourselves at the very outset that the agitation for the five-day week is simply the latest of a series of attempts to shorten hours which began more than 100 years ago. We have found a productive system constantly increasing in efficiency per man and per hour. Accompanying this increase, but lagging somewhat behind it, there has been a shortening of hours of work. The 10-hr. day has almost entirely supplanted the 12-hr. day and, in many instances, has been itself succeeded by the 9 or 8-hr. day, with the Saturday half-holiday by no means unusual.

In each period of agitation for shortened hours, we have seen the new demand urged before the previous one has been fully satisfied. Today we may say with approximate accuracy that the 8-hr. day has become standard although still far from universal; that the Saturday half-holiday is widely observed and is gaining in favor; and that the movement for the 5-day week is persistent and influential.

Four Different Arrangements of Five-Day Week

The so-called 5-day week may mean any one of at least four quite different arrangements. First, there is the shortened working week adopted permanently or temporarily, as an expedient of management without any change in wage rate. Over this kind of curtailment of working time, there is little controversy, and it will continue to be adopted whenever it is to the best interests of the business, and employees will not object to a shortening of working time when business conditions threaten to eliminate their jobs altogether.

Next, there is the arrangement under which a standard number of hours per week is concentrated in less than six days, as is the case of a company formerly working 48 hours in six days which goes on a five-day week and distributes the extra 8 hr. over the five days.

Then, there is the case of the shortened working week adopted as a concession to labor, with a corresponding increase in wages without any assured increase in output per man. Finally, there is the shortened working week with increased daily output and corresponding increased pay, that is, with processes speeded up, or the efficiency of labor increased.

These last two types of short week are the ones that involve serious questions of economics and of management, and about which are centered most of the controversy over the cutting down of working periods. Actual adoption of the five-day week or of any similar shortened working period does not appear to be proportionate to the amount of publicity the project has received.

In nearly every instance, where the five-day week has been attempted, the change has been from a five and a half day week, and in most cases the work is on a piece-work basis. Most of the firms on the five-day week employ less than 500 workers. Where there has been a success, it is because of all or one of the following reasons: Power has been saved; absenteeism has been reduced; time in getting out and putting away work has been reduced; labor turnover has been reduced; and a better supply of labor has been made available.

Some of the companies that have adopted the five-day week believe that they have been able more easily to recruit labor and to hold a high type of employee in their service. There are other employers who believe that workers are more efficient after two days of rest and that the increased output in the five days makes up for any loss of production resulting from the Saturday shutdown.

When Shorter Week Will and Will Not Be a Benefit

The productive capacity of the United States has outrun the consumptive capacity of our market. Moreover, it is much easier to increase productive capacity than to enlarge the buying demands of the people. Every industrial engineer knows that with our limitless supplies of capital, our yet undeveloped resources, and our inventive genius and managerial ability, the production in almost any line might be expanded almost indefinitely. But consumption is another thing. To sell our products, we must have buyers and those buyers must have wants and money with which to satisfy them. High wages, therefore, has come to be an essential element in continued high production.

If labor employed on a five-day week can supply the actual and potential demands for commodities at a total labor cost no greater than that involved in a

longer period, the shortened week will be a distinct gain to industry in general and to the individual company in particular. If, however, the total labor cost is increased, the presumption turns strongly against the shorter week, and a reduction in the working period will require for its justification some compelling reason in each industrial circle.

Foreman Classes at Delco Light Company

"THE Foreman and His Job," a paper by T. B. Fordham, works manager of the Delco Light Co., Dayton, Ohio, and president of the National Association of Foremen, was presented at the same session.

Educational work is conducted under the personnel division of the company, and the main part of this activity centers in the foreman classes. The day classes are held during working hours, and each member attends one meeting each week. These classes are kept small so that the instruction may be as nearly individual as possible and so that the meetings will not interfere with production.

These foreman classes concern themselves with the human side of manufacturing and not with the material side because, they are made up of men from various departments, and specific operations of one department cannot be of general interest to all. The human side is also emphasized because it is felt that the detail of the manufacturing should be handled by the superintendent or general foreman of the division in classes, or individually as they may consider necessary; and because defective work and high cost often are not due to the lack of material knowledge as much as to a lack of getting done that which is already known.

The first subject discussed is the main difference between the material and human sides of industry; the next topic is the place of the foreman and the under executive in the organization. The third factor taken up relates to the fundamentals that underlie all human relationships, and in this connection an effort is made to show that human relationships are the same inside of the plant as outside. Another subject considered is that of "Open-Mindedness" to new ideas, and the necessity of cleanliness and order is given consideration. Other topics discussed include cost and the prevention of waste.

In connection with the personnel division of the company, it was stated that its function was "to create a healthy, intelligent, interested organization and working force." New men coming into the Delco plant are assembled in a class the day they are hired and, on company time, have explained the general policies of the company, and the specific things that underlie successful work.

Production Efficiency Less Than 50 Per Cent

Dr. Dexter S. Kimball, dean of the college of engineering, Cornell University, in an address on "The Trend of Science in Management," called attention to the large volume of observed facts that have been recorded in the past 300 years. The rate of growth of this scientific background, he said, shows no signs of decreasing.

In his opinion, the average efficiency of production in this country is not 50 per cent at best. Engineers are working to overcome this handicap and in so doing they are questioning some of the conclusions of theoretical economists that so far have stood unchallenged. For many years it was considered unsound to pay higher wages than competition in the labor market demanded and it was maintained that low cost was synonymous with low wages. However, it now has been proved that high production, high wages and low cost can well be concomitant.

Demonstrates "Motion-Time Study"

In a paper on "How to Analyze Manufacturing Operations," A. B. Segur, industrial engineer, Oak Park, Ill., stressed the importance of exact knowledge as a basis for rate determination and establishment of efficient operation. He also emphasized the necessity of having a means to check back the actual conditions existing during the study.

Based on motion study by the use of the micromotion methods, made possible by motion pictures taken under carefully planned conditions and scientific analysis of results, Mr. Segur showed how by the use of what he terms "motion-time study" it is possible to study incorrect methods of operation which cannot otherwise be noted by even the most experienced time-study expert who uses the stop-watch method. He gave a demonstration of the micromotion analysis in connection with a study of the operations involved in refilling an Autopoint pencil.

Claire Furnace Case Is Now Dropped

Federal Trade Commission Will Not Further Pursue Demand for Steel Company Cost Data

WASHINGTON, May 31.—The Federal Trade Commission has permanently dropped the Claire Furnace Co. case, involving also 21 other iron and steel and related companies. Announcement to this effect was officially made by the commission last Friday. Soon after the recent decision of the Supreme Court of the United States it was stated at the commission that it had tentatively concluded to proceed with the case through mandamus proceedings. The Supreme Court dismissed the original bill because of wrong procedure. It was at first the desire of some members of the commission to resume mandamus proceedings begun against the Bethlehem Steel Co. and the Republic Iron & Steel Co., as part of the case against all of the companies, which had succeeded in getting injunctions against the commission in the Supreme Court of the District of Columbia and the Court of Appeals in Washington.

In finally concluding to abandon the Claire Furnace Co. case the commission gave as its reason the lapse of the appropriation granted for the investigation, and its present lack of funds to pursue the inquiry further, together with the desire to raise the point as to the power of the commission through other and more immediate requirements for information of the kind which had been sought, including cost reports, etc. It is reported in the coal trade that the commission, in an effort to determine its power, will proceed with the Maynard Coal Co. case, which is held to have involved issues parallel in every respect to those surrounding the Claire Furnace Co. case.

The statement of the commission regarding its abandonment of the Claire Furnace Co. case follows in part:

"Information required by the reports, which included prices, production, stocks on hand, quantities sold and costs of producing certain iron and steel products, was sought by the commission in connection with an investigation instituted in 1920. The object both of Congress and of the commission was to ascertain the causes of the then existing high cost of living, and to publish the facts with respect thereto which might be secured in the investigation, for such corrective effect as it might have. The commission also had in mind the possible disclosure of violations of law as one of the causes of existing high prices.

"The appropriation of $150,000 made by Congress on Nov. 4, 1919, for the purpose of defraying the expenses of this investigation, has long since lapsed, and the commission is without funds at this time to pursue the investigation further.

"Moreover, while the question of the commission's power to require reports of the character involved in these suits is of vital importance, the commission prefers to raise this question in some investigation where there is immediate present requirement for the information."

Our Foreign Trade Is Changing

Less with Europe but Considerably More with the Orient—Reprisals a Mistaken Method of Correcting Adverse Balances

BY JAMES A. FARRELL*

THROUGHOUT the proceedings of this convention you have heard that the foreign trade of the United States last year made substantially the same rate of growth that has marked its course for the last decade. Both exports and imports were greater in volume than they had ever been.

Europe's proportion of our exports is 14 per cent less than it was twelve years ago, and Europe furnishes 20½ per cent less of our imports than she did during the 1910-1914 period. It is when other parts of the world are taken into account that the real development of our trade is clearly disclosed. We are selling more as we buy more, and that is as it should be. Imports from Asia, for example, have quadrupled in that time; and exports to Asia have more than quadrupled. . . .

Direct Balances Not Decisive

The time has gone by when direct balances between separate nations can be struck accurately without reference to other countries, or when these direct balances can be taken as a criterion of the actual trade positions of these countries. It is true we may make statements of account between two nations with practical accuracy. But it is as futile to seek to maintain an even balance in the exchange of goods between any two nations of the world as it would be, for example, to demand that the trade of any two of our States should show an even balance. We may almost as reasonably talk of even trade between Rhode Island and Michigan as between the United States and Argentina, or between the United States and Great Britain.

Countries which see something disadvantageous in their adverse trade balances with the United States should take into consideration their indirect trade and, should they still desire a more even balance in their direct trade with us, study means of increasing the range of their products which may be saleable in this country. There are, on the other hand, many markets of the world where the United States buys much more than it sells.

We recognize that in such markets our purchases furnish a supply of dollar exchange which, transferred in due course to other countries, enables other countries to buy from us more than they sell to us. Or else it becomes a problem for our enterprise and initiative. What can we produce that will find sale in those markets? How shall it be merchandized? How shall we meet this challenge to our skill and our service?

Surely not by invoking the aid of regulatory measures that invite retaliation and promote friction, or by introducing contentious questions of international policy. Rather by increased effort to understand and meet the wants and desires of those markets.

Our Large Purchases from South America

The suggestion comes to us not infrequently that we do not buy as much from certain countries as they buy from us. We have all heard, very recently, representatives from some of those countries speaking openly about measures that may be taken to compel a readjustment so that their sales to us shall more nearly equal our sales to them. It has even been hinted that an embargo will be laid on United States commerce despite the fact that we buy from South America as a whole over $100,000,000 worth annually more than the countries to the south buy from us.

It is to be remembered that markets are elastic not fixed. There is never a rigid limit to the capacity of any field. No one can foretell accurately what effect any new product will have, either on its own immediate market or on others far removed. The sale in the United States of a certain delicacy helped Ecuador out of a period of depression by increasing our demand for her cocoa. Ecuador got a new and unexpected supply of American dollars with which she bought various things that she wanted, including American made pianos. The man who originated the idea of coating a slab of ice cream with chocolate probably never dreamed that he was helping to increase the foreign trade of the United States.

A Three to One Trade with Brazil

We buy annually from Brazil, nearly three times as much as she buys from us. Coffee is the chief item of our purchases in Brazil. Suppose we were to adopt the plan of arbitrary regulation and limit our purchases from Brazil to an amount equal to her purchases from us. What would be the result? Many Americans would have to cut down their consumption of coffee and for what they did use they would have to pay a much higher price. But that would really be only an incident. The chief result would be the general disruption and demoralization of Brazil's commerce with other countries, and reflected elsewhere.

Brazil would be deprived of the dollars with which she now buys much of what she requires in Europe or other parts of the world. She would have coffee only with which to pay, instead of dollars, whereas those countries want the dollars, not the coffee. They buy as it is what coffee they want, almost one-fifth in the aggregate of the Brazilian crop, and have no use for any more. If they took more they would be obliged to resell it elsewhere, perhaps to us. Thus the only effect of such an attempt on our part would be to enforce trade readjustments elsewhere and force trade into new and uneconomic, because unnatural, channels.

Brazil buys from Argentina annually something like ten million gold pesos more than Argentina buys from Brazil. Obviously a substantial part of Brazil's capacity to take that excess from Argentina arises from our own excess purchases from Brazil. The position of Argentina is the same as if we bought that amount directly from her; she may very likely profit from the fact that transportion is indirect.

Increased Production Should Be the Common Aim

It is neither necessary nor wise for any nation to insist upon an even exchange of goods with any and every other nation. What one buys anywhere enables the seller to buy where it finds its best advantage. It is the sum of all the purchases which balances with the sum of all the sales. The way to prosperity for the United States and for all other nations is along the line of increased production and lower cost, for that is what makes power to purchase and consume.

The international trade of the United States is growing steadily, and no doubt will continue to prosper as the purchasing and consuming power of the rest of the world gains. But our growth will not be fortuitious or gratuitious. It will be the result of our own intelligent effort. It is recognized that we possess industrial skill and enterprise in high degree, but that alone will not suffice. We must also see the international picture in perspective and not rely on our economic self sufficiency. The development of our foreign trade is not only important but essential to our national growth.

*Extracts from Mr. Farrell's presidential address at the 14th National Foreign Trade Convention at Detroit, May 27.

Leaves from the Diary of a Foundry Apprentice

BY H. A. FROMMELT*

Feb. 9.—Big stir around the plant today. We lost a big 35-ton casting—the boys say it exploded like a bombshell when it let go sometime last night. Still, they say it only cracked. I must find out what it was and why the noise. At noon today among the gas-house gang there was quite an argument. One of the old molders said the boss was just kidding the bunch when he tried to tell them that he did not care about the $10,000 the company would lose, but that their reputation might suffer. He knew it was the money, even though it was not anywhere near $10,000. He claimed he knew what the steel cost at the ladle and how much their labor had been. All in all not nearly $10,000, not even half that much.

At this one of the fourth year boys spoke up and said he could not see how they figured the loss only $10,000. He could figure out that the labor and materials alone must be at least $5,000 and the overhead was certainly 100 per cent. "What do you know about overhead?" "What I have been told and what I can see for myself. If the regular overhead runs 100 per cent then they ought to figure at least 150 per cent for this job."

Everybody from the president on down had spent time on this job and so the salary overhead was certainly higher. It was left in the mold on the floor for at least 10 days, taking up valuable space, and this shot the costs up a lot more. An addition had to be built on the annealing oven, which would have to remain now until another was cast. Special rigging had to be built for the mold and the pit dug deeper. When he added all these up and threw in the loss of good will of the customer because of the delay, I believed he was right in saying these "dead" charges are a lot more than the "live" ones.

Feb. 10.—Beat it for the gas house as soon as lunch was over. I knew the argument about overhead would continue. Sure enough; when I got there some of the old birds were kidding the "red" because a young chap not even out of his time tripped him up. And today young Fellsworth had the figures and kept right at him. Finally the old fellow came at him about the big surpluses the company had laid aside. Fellsworth made delicious "bologna" of that.

He pointed to the gas producers we were leaning against (that's why they call it the gas house club) and wanted to know whether it did not take cash reserves to spend a hundred thousand or so for these producers and then abandon them after a couple of months because the sulphur and phosphorus were too high for the customers. (There is that chemical stuff again. I must dig it up.)

He also pointed to the sand slingers that were bought for the wheel business and then abandoned because some one had proved that wheels could be made cheaper by centrifugal casting. I know more about the foundry business now that I am ignorant of than I can learn in the next six months. "Overhead"; "gas-producers"; "sulphur"; "sand slingers"; "centrifugal castings"; here's a real job.

*Consultant, St. Louis.

Feb. 12.—I made it my business to meet Fellsworth through Jim. He told me that "overhead" is discussed in the shop talks and in class aplenty. I wonder why the company does not tell these old birds about it. It seems to me it would save a lot of growling and grouching and make for more and better work. May be that's another reason for apprenticeship.

Lincoln's birthday. The apprentice supervisor used the 20 minutes for the shop talk today to tell us about Lincoln's ideas concerning the "mudsill theory of labor." I have just read the whole speech he made at Milwaukee in which he states his ideas. The company sure is hitting the mudsill theory in apprenticeship. They are giving us a chance to learn all about the foundry game, even some of the business side of it.

Feb. 15.—Had my first lesson in "overhead" today. I know now what Jim meant when he said there was more to it than just cranes. I did not blow out my mold as I should have—just a simple locomotive female center casting—and there was a sand spot. I couldn't get away from it, because there was only one of that pattern number. Mr. Haney took me over into the machine shop and pointed to the casting on the boring mill with the sand spot showing up like a case of small pox. And the machinist shoved three tools under my nose as dull as the family paring blade and muttered something I did not want to understand.

Then Mr. Haney produced the figures of labor and material and showed how these must be doubled at least because of the supervision, power, interest on money invested, taxes and wear and tear of machinery, buildings and equipment (depreciation I believe he called this), etc. That's the deaf and dumb method of rubbing it in—not necessary to say or hear a word.

Feb. 16.—Some young fellow from the pattern shop started putting in his three months in the foundry. Mr. Haney had him tell us greensanders about patterns, their how and why in the foundry. I got the "draft" and the reason for the bum fillet making a jagged edge, but I don't understand why steel shrinks more than cast iron. I have that marked down for further questioning. I wish Webster had written a foundry dictionary.

Feb. 17.—Cut a gate too small yesterday and so today I had another silent bawling out. Just when I thought I knew all about these simple molds and was ready to ask for something different, this steel does the prima donna stuff and refuses to flow through the gate. I am beginning to believe there are some more mysteries that will jump up and hit me in the face, almost any time.

Feb. 19.—The superintendent took pride in showing me some of my castings that came out swell. They have a regular detective system here to trace these pieces of steel, even through the shake-out pile, the cleaning room and the annealer. But I swelled up a bit as I admitted they were mine. It's great to see a nice casting that came from your own work, the hard steel, the sharp edges and the smooth rounded corners, and not a sand spot or blow hole any place. It takes more than a weakling to turn them out like that. It was a big bearing cap for a steam turbine and for that they have to be just about perfect.

Feb. 24.—The machine shop and the foundry apprentice teams played a nice game Washington's birthday. No work and so a bunch of us played with the regulars and gave them some practice. We beat the machine shop team badly. There's nothing like foundry work for training. I can't see how a machinist can stand it in one place all the time just watching a machine running. And as Jim says, "they couldn't run their machine shops if we did not give them the right kind of castings."

Worm Drive for Steel Mill Units

Advantages Claimed in Use of Worm Gearing for Ladle Crane and Charging Machine—Roller Bearings Used, Also

APPLICATION of a worm drive to the hoist of an electric traveling ladle crane is found in a 165-ton crane recently erected in the new open-hearth and electric furnace department of the Timken Roller Bearing Co., Canton, Ohio. In the same plant is also the first worm-driven open-hearth charging machine. Both the crane and charger were designed and built by the Alliance Machine Co., Alliance, Ohio. Both crane and charging machine have Timken roller bearings throughout.

While steel makers have been striving successfully to increase their outputs, necessitating handling larger tonnages in a given time in the manufacturing processes, the crane builders, with the improvements they have made in their equipment, feel that they have not only kept abreast with the demands of the steel industry, but a little ahead of those demands. The improved handling equipment for steel plant use described in this article is referred to in support of this claim.

Besides the 165-ton main hoist, the ladle crane has a 50-ton auxiliary trolley and on the latter is a 15-ton auxiliary hoist. The crane is of the four-girder type. The main trolley frame is built up of structural steel and steel castings. The hoist on this trolley is of the two-motor, double-geared, interlocked drum type, each of the intermeshing drum gears meshing with a pinion carried by a shaft, at one end of which is mounted a worm gear.

One worm gear is cut right hand and the other left hand and they are so placed that the meshing worms are in line with each other and at right angles to the drums. Each worm is direct connected to a 110-hp. motor through a flexible coupling, the motors extending toward the ends of the trolley. The two worms are direct connected to each other by means of a shaft and flexible coupling, this arrangement permitting simple and accurate adjustment between the two lines of gearing so that, although the drum gears are intermeshing, there is no actual contact between the teeth in the normal operation of the crane. This intergear arrangement is provided solely as a safety feature in case of failure of a drum pinion, shaft or worm gear. Two electric brakes are provided, either one of which will handle the full load of the crane. These brakes are located on the inner ends of the worm shaft.

By coupling together the armature shafts as described, the two hoist motors are synchronized thus serving to eliminate strains due to unequal adjustment or operation of the brakes. This was demonstrated by removing the drum shaft bearing caps and operating the crane under full load with one brake disconnected. Under these conditions there is no tendency for the drum shafts to lift from their bearings. It is pointed out further that either motor may be disconnected by removing the flange bolts in the coupling and the hoist then operated by the other motor without increasing the stresses in the gearing. It is also to be noted that, while the old type of ladle trolley requires at least 12 spur gears on this hoist, this new design has only four.

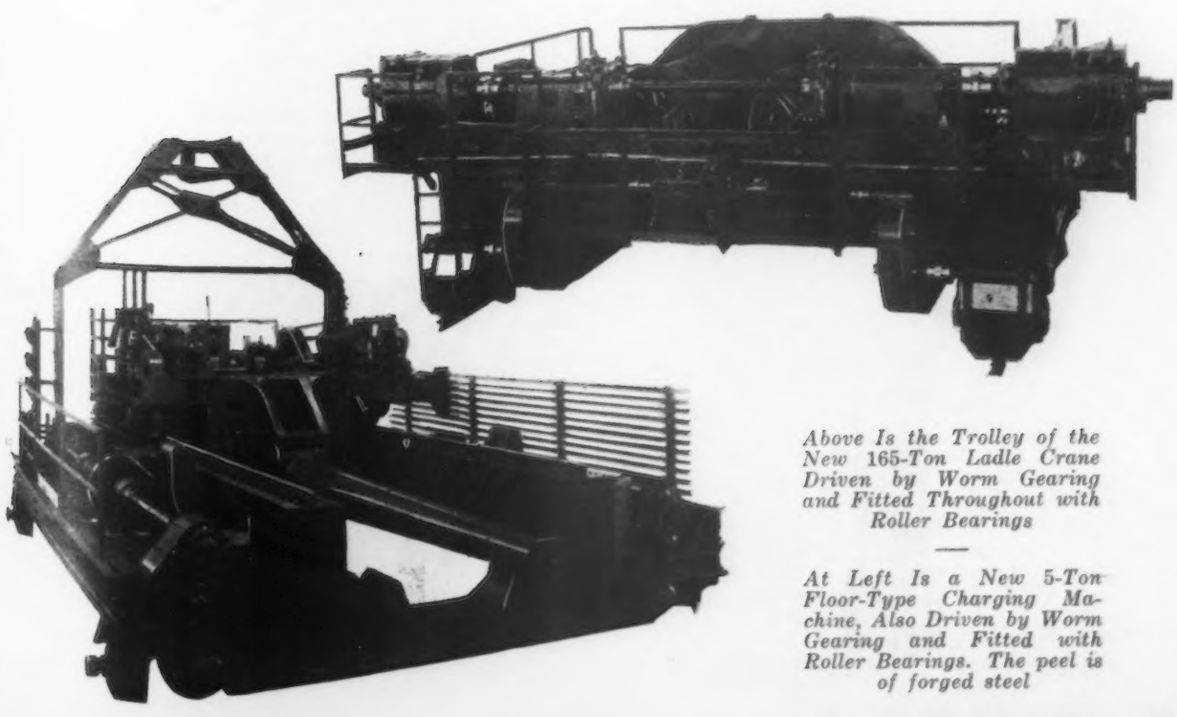
The trolley is driven through flexible couplings and shafts extending from each end of a 40-hp. motor to two spur gear reducing units, which are connected to the track wheel pinions by means of flexible couplings. This trolley is provided with compensating trucks, there being four track wheels at each end.

The bridge is driven by two 90-hp. motors, one at each side of the crane. It is mounted on double compensating trucks carrying 16 wheels, eight at each end. Magnetic control is used on all motions, with dynamic braking on all hoists. While the rated capacity of this crane is 165 tons, it was tested with a load of 225 net tons, exclusive of the lifting beams and ladle hooks.

Charging Machine

Operated by five motors, the charging machine is of the low type, of 5 tons capacity. Hoist motion for raising and lowering the peel, and the transverse motion for charging in and out of the furnace, are both driven through worm gears. The operator has an unobstructed view of the peel, charging boxes and the furnace hearth.

The trolley frame is a one-piece steel casting that in its rough state weighed 36,000 lb. Various brackets are now integral parts of the trolley casting, and



Above Is the Trolley of the New 165-Ton Ladle Crane Driven by Worm Gearing and Fitted Throughout with Roller Bearings

At Left Is a New 5-Ton Floor-Type Charging Machine, Also Driven by Worm Gearing and Fitted with Roller Bearings. The peel is of forged steel

the end carriage is also a one-piece steel casting. The peel is of forged steel; it is claimed that the forged peel will outlast one that is cast for the reason that its surface will not check and that it will suffer less deterioration from the effects of the heat.

The peel and peel bracket are mounted on a fulcrum pin located at the front of the trolley. Raising and lowering of the peel are secured by means of a crankshaft at the rear of the trolley. Two adjustable connecting rods extend from the rear end of the peel bracket to the cranks. The crankshaft is driven by a 40-hp. motor through a worm gear reduction of 20 to 1.

The trolley travel motor is of 30-hp. capacity and is located on the top of the trolley at right angle to the drive, to which it is connected through worm gearing. The peel is rotated through spur gearing by a 5-hp. motor located on the peel bracket. The bridge is operated by two 40-hp. motors, one on each side of the machine, driving all track wheels. These motors, located on the bridge girders, are supported by two outside auxiliary girders.

Magnetic control is provided for all motions.

In a test operation this machine charged 100 tons of scrap in 40 min. The intergeared drum type of ladle trolley is protected by a patent of the Alliance Machine Co. and patent applications have been made by the company covering the worm drive and accessories for both the crane and the charging machine.

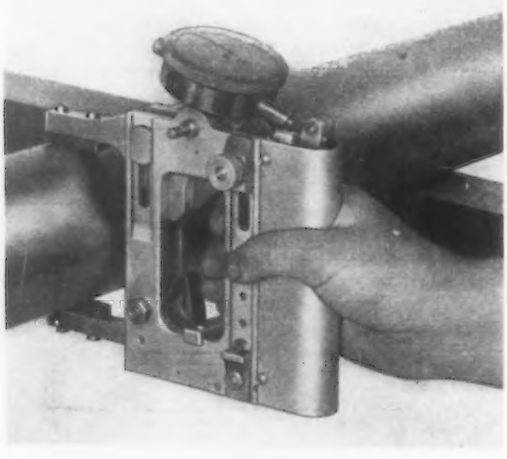
Equipment for Production and Inspection Measuring

System Developed Includes Not Only Instruments but Also Means for Producing, Storing and Charging Out Reference Standards

A MEASURING system, named the Comtor, for use in connection with the quantity production of interchangeable parts, has been brought out by the Comtor Co., Waltham, Mass.

The Comtor System, developed over a period of several years, comprises various instruments for measuring at the machine tool, and for inspecting outside and inside diameters. It includes not only measuring instruments, but also means for producing the working reference standards and flexible-unit means for storing, identifying, charging out and checking shortage of ring, disk, and gage block standards, providing for the continuous growth of the equipment in the new and duplicate sizes.

All instruments in the system are of automatic spring-operated type, in which the gaging or contact



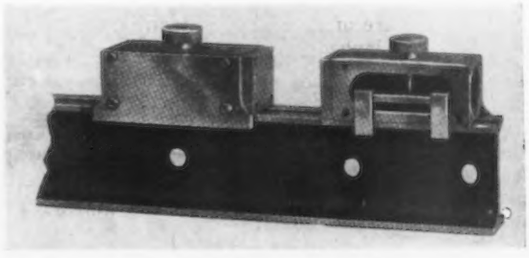
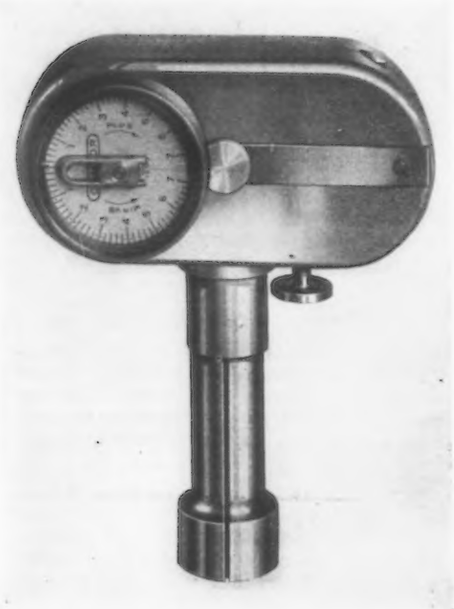


FIG. 1 (Left)—The Comtorgage Is for Accurate Measuring of Outside Diameters. Among other uses, it may be employed for inspection of bars and tubing.

Fig. 2 (lower left)—Comtorplug, for holes less than 2 in.

Fig. 3 (above)—The Comtorslide is intended to eliminate need of large and special reference ring gages.

Fig. 4 (below)—Comtorbox for storing reference standards.



surfaces are applied to the reference standard and to the work in progress by a uniform spring pressure. This is stressed as eliminating the human factor in the adjustment and use of the instruments. The "following-up" pressure of the spring is claimed to cause automatic squaring of the anvils on the work, assuring close precision of measurement. All flat anvils and other contact surfaces are of precision gage-block manufacture. They are of special tool steel, hardened, tempered, seasoned, lapped and light-wave tested.

Fig. 5—With the Comtorstand, Reference Standards May Be Kept at the Machine Tool

One of the instruments, designated as the type O Comtorgage and intended for measuring outside diameters, is shown in Fig. 1. In this case the instrument is employed for inspecting cold-drawn bars, seamless tubing, etc., for diameter and out-of-roundness, the bar being simply rolled along the rails while the Comtorgage is held on it. For hot-rolled bars a dial gage of less amplification is employed on the Comtorgage.

In grinding operations the instrument may be held on the revolving work while grinding is in progress. The anvils can be reversed, and inverted, providing four new wearing positions. The center stop is automatically adjusted for different diameters of work. The instrument may be equipped with special anvils for measuring the diameter at a fixed point on a tapered piece. It is also adapted for use in measuring the depth of screw threads by the three-wire method. A type I instrument for measuring holes over 2 in. in diameter is also available, this gage being similar to that shown in Fig. 1, except in the arms and anvils, in the omission of the center stops and in that the spring is reversed.

In Fig. 2 is shown the Comtorplug, which is for measuring holes under 2 in. in diameter. The instrument is contracted by hand and released in the hole, where it is expanded by its spring. Different sizes of interchangeable expansion plugs fit the same amplifier casing. The plugs may be changed quickly, and one amplifier, with a set of basic sizes of plugs, covers the entire range of standard sizes for use to any tolerance.

Another device in the system is the Comtorslide, shown in Fig. 3, the use of which eliminates the need of special and large reference ring gages. The jaws may be adjusted to gage blocks, a cylindrical standard or a rod gage, and the inside type of Comtor instrument is then set between the jaws. The hard steel anvils can be turned to four new wearing positions. The instrument may be taken to the machine tool for checking the Comtorgage or Comtorplug.

Comtorblocks, which are small and comparatively inexpensive sets of precision gage blocks, are available for use with the Comtorslide. These are for use in measuring all standard sizes of holes. For special holes, the usual decimal set of gage-blocks is employed.

The Comtorbox, for use in storing reference standards, is shown in Fig. 4. The flexible unit construction consists of pairs of easily removable interchangeable rails in which the suspended bottom support is adjustable for elevating any diameter of standard to its convenient level. The complete unit with its load may be lifted out and transferred. The identification clips are moved and clamped where required and the identification plate slipped into place under the window. The reference standards are arranged in the order of their increasing diameters. Workmen's checks are deposited for standards issued; if a complete space is not filled or accounted for a loss is indicated. With the Comtor System, where the reference standard is a working element, such means of caring for the reference standards is an obvious necessity.

A convenient means of supporting cylindrical working reference standards at the machine tool is provided in the Comtorstand shown in Fig. 5, a feature of which is that the standards are kept at the temperature of the room and do not become distorted or expanded by handling.

Another of the company's instruments is the Microcomtor, for producing working cylindrical standards that are plus or minus the fit differences over and under the basic or master disk. This instrument, previously announced by the company, is not an essential part of the Comtor System, and is not needed by those who prefer to order all their working standards from gage specialists. It comprises a spring-operated micrometer screw, geared to a retarding ran through an absorbing clutch. An automatic brake, operated from the center stop, locks the instrument before it is removed from the work. The Microcomtor is graduated to ten-thousandths and easily read to 0.00005 in. or closer. It is claimed that in use for copying a standard with fit differential, a 2-in. Microcomtor has been found by trial to be dependable to plus or minus 30 millionths inch.

In addition to those described above, other instruments and appliances are made for the Comtor System.

Siphon-Feed Paint Spray Unit

The Alexander Milburn Co., 1416 West Baltimore Street, Baltimore, has placed on the market a paint spray unit, designated as the type El siphon-feed outfit, which is made up of the company's type E gun with quart container, air conditioner, air regulator and air hose and necessary connections.

This outfit is adapted for a wide range of painting, and is said to operate efficiently whether using heavy anti-corrosive paints or thin lacquers. The gun can be adjusted for fine work, such as touching-up, shading and high-lighting. An ordinary "garage" air compressor will furnish the necessary volume of air to operate the gun. The atomization of the spray is said to be so fine and even that "orangepeel" is eliminated, minimizing sanding and rubbing. The atomized spray is surrounded by an air pocket which lessens the loss of material, utilizing the entire spray in thoroughly covering the surface.

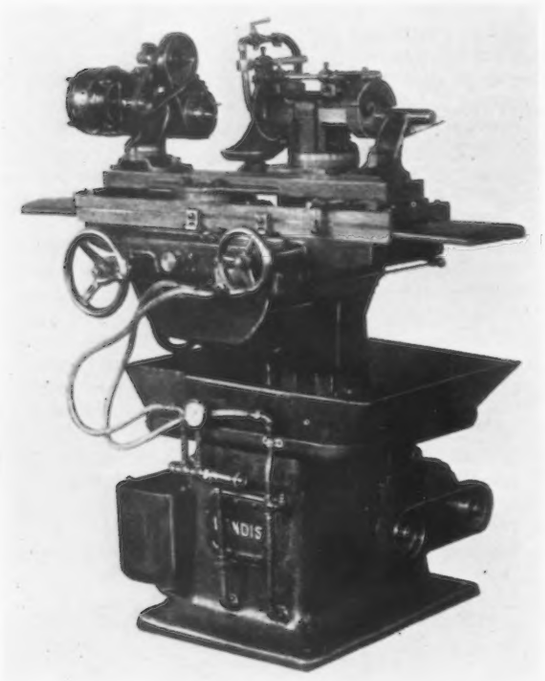
Paint Spray Unit for Painting and Lacquering a Variety of Work. The gun can be adjusted for touching up and shading

An air purifier assures delivery of pure, dry air to the gun, for good finishing results.

Self-Contained Drive Features Redesigned Tool and Cutter Grinder

The Nos. 11 and 12 tool and cutter grinder of the Landis Tool Co., Waynesboro, Pa., have been redesigned and arranged for complete self-contained drive, as shown in the accompanying illustrations. The No. 11 grinder is for plain work only, and the No. 12 machine is for regular universal tool room work.

Two motors provide the power for driving the various units of the machine. The wheel-spindle and traversing mechanism is driven by a 2-hp. constant-speed motor mounted on the rear of the base of the



The Headstock Drive Is by Means of a 1/6-Hp. Motor Through Two Belts and Reduction Pulleys

machine. From the motor, the drive is through a double-vee composition rubber belt to a shaft in the base of the machine, and then through a 1¼-in. belt, which passes through the hollow column, to the spindle. In this construction the belt is completely protected and uniform tension is maintained by means of a gravity idler pulley.

The headstock is driven by a 1/6-hp. constant-speed motor which gives, through two belts and reduction pulleys, a speed of 200 r.p.m. to the work. This motor is mounted so that the full universal features of the headstock are maintained, and the headstock can be swiveled 180 deg. in either a vertical or horizontal plane.

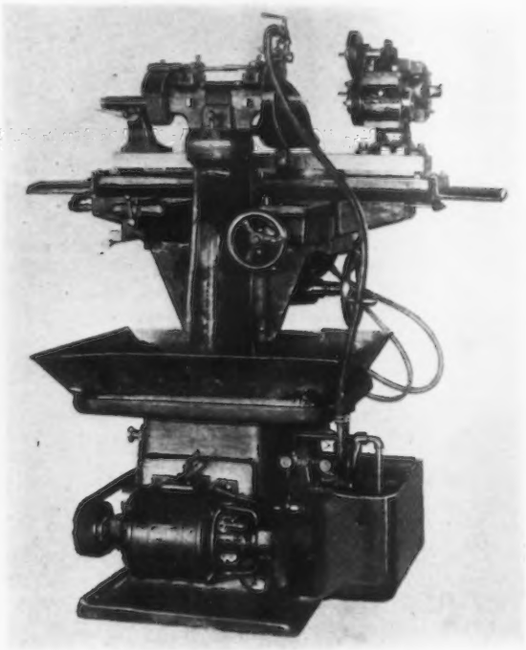
The hydraulic principle employed on other types of the company's grinder has been applied to these machines for furnishing power for the automatic table traverse. The oil reservoir is located in the base of the machine, and the oil is pumped from there to the reversing mechanism under the carriage. The oil pump is driven by silent chain from the driveshaft in the base of the machine. Traverse speeds of 6 in. to 360 in. per min. can be obtained while provision is made whereby the carriage will tarry at the reversal point to permit indexing the work. If desired this feature can be disconnected and the reversal will be automatic. The carriage can also be reversed by hand at any desired point when necessary. This hydraulic principle is regarded as a distinctive feature of this machine, its value and importance being said to be reflected both in the quality and quantity of work produced. The hydraulic feature may be omitted from the No. 11 machine if desired and the regular rapid hand feed substituted.

The wheel-head has been changed, and the tapered bearings have been replaced with larger size cap bearings. Laminated shims are used under the caps while the bearings are lubricated by means of a felt wick from a reservoir in the bottom section.

The machine may be operated from the front or from either side of the column in the rear. The control levers and handwheels are all readily accessible from either position while the elevating and cross-movement handwheels are graduated in thousandths.

Except for the changes noted above the machines retain all of the features of the original design. The saddle is supported by two V-guides 16 in. apart, to prevent rocking. The double V-guides insure permanent alinement and automatic take-up for wear, eliminating adjustable gibs. The carriage is alined to the saddle by V and flat guides of liberal dimensions. Special attention is given to protecting all moving parts and wearing surfaces from dust and grit.

The machines have a longitudinal movement of 17 in., a cross movement of 9 in. and a vertical movement



The Wheel-Spindle and Traversing Mechanism Are Driven by the 2-Hp. Motor at the Rear of the Base

of 10½ in. Work 10 in. in diameter and 20 in. long can be swung on the work centers, and face mills up to 18 in. diameter can be ground without the use of raising blocks.

Motor-Driven Cross-Cut Saw

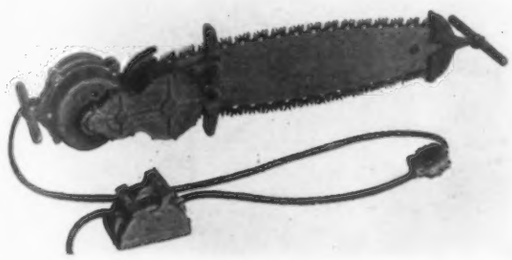
The "Wolf" portable link sawing machine is a motor-driven cross-cut saw manufactured by the Reed-Prentice Corporation, Worcester, Mass. It is intended for sawing timber used in mines, for constructing trestle bridges, for building dams, docks and bulkheads and for other purposes for which hand cross-cut saws are used. The cutting speed is three to four times faster than that of a hand cross-cut saw.

The frame of the saw is made up of four pieces of saw steel, heat treated to insure long life and rigidly assembled by electric welding. The filler piece, which is smaller than the outside plates, forms a channel around the edge of the frame in which the saw links travel and assures straight-line cutting. Four steel guide pins, a shaft and two spiders, one on each side of the machine, connect the saw frame to the motor, or drive, end. The four guide pins hold the frame in positive alinement, and the shaft and spiders clamp it rigidly to the motive end.

The saw links are made of individual pieces consisting of raker and cutter links, link pins and bushings. The cutters are held in alinement by the pins and bushings, and the latter act as spacers as well as pivots on which the raker links turn. The saw links are made of steel accurately machined and heat treated. The action of the saw links is the same as that of a rigid saw, and buckling is prevented since the rakers

and cutters act in opposition to each other and offset buckling tendencies. The links on the cutting side of the machine travel toward the motor, thus keeping the machine against the work and eliminating dogging or fastening.

The motor operates on 220-volt 60-cycle 3-phase alternating current. Nine feet of three-wire heavy flexible rubber-covered conduit is supplied with the machine. The machine may be connected with power at



Portable Link-Type Sawing Machine. The capacity is for cutting pieces of soft wood 25 in. in diameter at the rate of 2 sq. ft. per min. With two motors, the machine has greater capacity

considerable distances through cable. If a supply of power is not convenient, a portable motor generator set which the company offers may be used.

The machine is started and stopped by a foot switch. A three-point reversible plug of special design permits reversing the motor and the cutting direction of the saw teeth, thus equalizing wear and reducing the frequency of filing.

Two handles are furnished, one at each end of the machine. The handle and guard at the outer end of the machine may be removed, permitting the withdrawal of the machine from a cut in case wedging is necessary. The sawing machine is also built with a motor at each end.

New Elevating Truck with Chain Lift

Elevating trucks, designated as the series D, which incorporate a new lifting principle, have been placed on the market by the Baker-Raulang Co., Cleveland.

In this machine, the underside of the platform is fitted with four steel inclines which run against hardened steel rollers pinned to the truck underframe. During the elevating operation the platform is pulled up these four inclines by two roller chains. The maximum travel of the platform is 9 in., and the net lift is 6 in. Two additional rollers operate against the top of the forward inclines to prevent tipping of the platform and to keep it parallel with the ground regardless of the

The Platform Is Elevated by Means of Two Roller Chains

distribution of the load. The lifting unit consists of an inclosed compound-wound motor operating through a triple spur-gear reduction and a fourth reduction consisting of a double set of planetary gears working in parallel. This motor drives two hardened steel pinions which wind up the two lifting chains.

A limit switch, operated by a rack and pinion, is provided for opening the hoist motor circuit at both limits of travel. After the limit switch operates, the motor is brought to rest by means of an inclosed magnetic disk brake mounted on an extension of the motor armature shaft. The hoist motor may be stopped at any point and started up again or reversed, as desired. It is not necessary to go through the entire cycle of operations.

The frame of the machine is of structural steel, and the construction is of the company's straight-line type. The remaining parts on this truck are interchangeable with similar parts on all other of the Baker models. The driving axle consists of a Baker series-type vehicle motor driving two 20-in. wheels through a worm wheel reduction and a four pinion bevel gear differential. Drive shafts are of chrome-vanadium steel, while the universal joints are of nickel steel forgings. The wheels are mounted in ball bearings that provide for both radial and thrust loads. The trailing axle is an alloy steel forging.

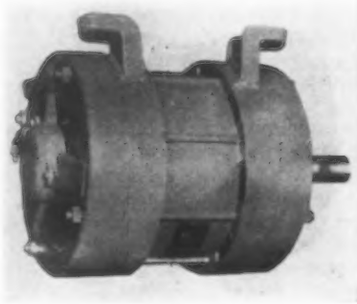
Several types of the new series elevating trucks are available, including a standard 3-ton model, a 7-in. type for low skids, a dock type with platform 17 in. high, a 5-ton truck having an elevating platform with standard 11-in. height and 26-in. width, and a 10-ton truck.

Ball-Bearing Induction Motors

All-steel, ball-bearing polyphase induction motors, ranging from 1 to 100 hp. in standard voltages and cycles, are being made now by the Lincoln Electric Co., Cleveland. In this type of motor gray iron and malleable castings have been replaced by steel.

It is claimed that every part of the motor is accordingly at least twice as strong. An example is cited in the case of the motor feet. Drop forged steel feet are welded on to the rolled steel end rings. Also the end brackets or bearing supports are made up of welded steel construction.

Economies in manufacturing by the new process have permitted larger shafts and bearings than usually



Features Include All-Steel Construction and Use of Ball Bearings

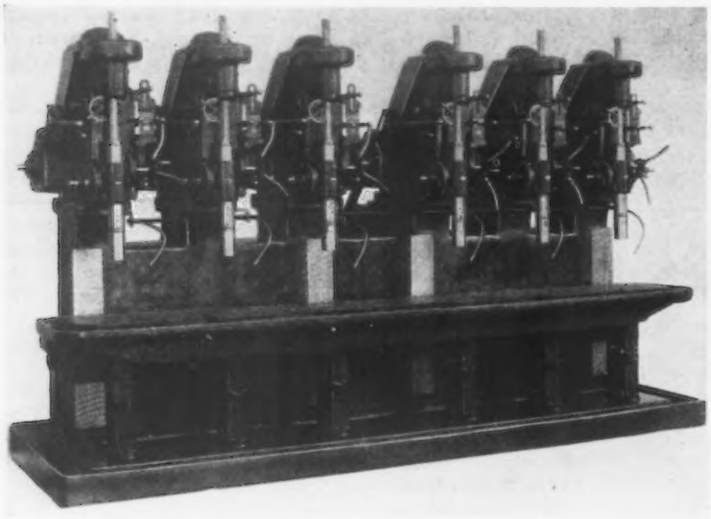
are found on this type of equipment. Less thickness of metal required in the frame and the increased ventilation obtained serve to afford a considerable increase in the overload capacity of the motor, such as a continuous overload of 10 to 50 per cent.

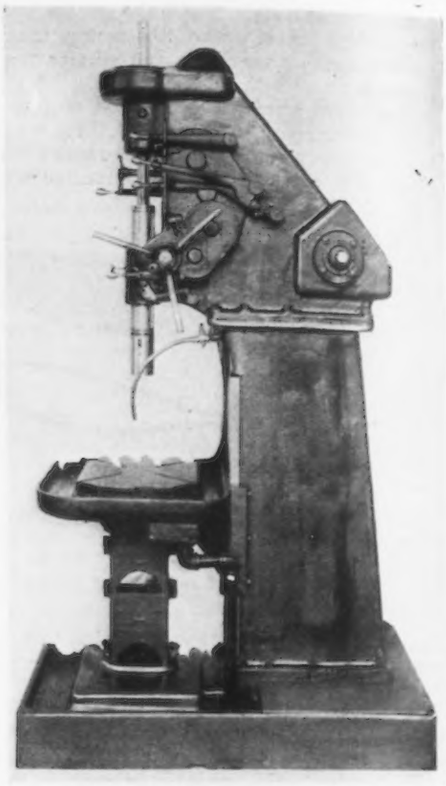
Adopt Novel Means for Preventing Accidents

The Riley Stoker Corporation, Detroit, has installed a unique safety reminder in the form of a bulletin board equipped with a red and a green light. The green light is kept burning as long as there is no one off at the plant on account of accident. Should an injury occur the red light is turned on and kept burning until the injured man returns to work. The space below the lights is used for posters and other accident literature.

The blowing of a whistle by the inspection committee as a signal for motor inspectors, crane machinists and mechanical men to present their danger signs and locks for inspection has been adopted by the Youngstown Sheet & Tube Co. at East Chicago, Ind., as a safety measure. Following the inspection any mechanical men who did not have their danger signs and locks with them are reported to the foreman in the department and a constant check is provided.

The Use of Slip-Block Supports Directly Under the Spindles Is a Feature of the Gang Table Construction. The width of the head and column may be noted from the end-view illustration





Announces New Production Drilling and Tapping Machine

Rigid construction of gang tables, and the use of ball and roller bearings on transmission and other shafts are among the features of a No. 242 self-oiling, all-geared production drilling and tapping machine, which has been brought out by the Barnes Drill Co., Rockford, Ill. The capacity is 1½ in. in steel.

The table of the new machine is equipped with slip block supports directly under the spindle. There are three of these blocks to each pedestal, and the blocks allow for varying the height of the table according to the requirements of the work. The table is securely gibbed to the column ways, and this, in connection with having the space blocks directly under the spindle thrust, is stressed as minimizing deflection of the table. Raising screws instead of slip blocks can be provided for the table if desired. The thickness of the gang head and the column, front to rear, is also a feature, this construction being stressed as eliminating any tendency of the head to lift away from the work when driving high-speed tools at maximum efficiency.

Another feature is that all diagonal transmission shafts, the crown pinion and crown gear are mounted in Timken tapered roller bearings, and the drive shaft and cross spindle shaft are equipped with Fafnir radial ball bearings. Spindle thrust is taken on Rollway double-staggered roller bearings.

In general design, the machine incorporates the inclined shaft speed change drive and the self-oiling all-geared features of the company's previous machines. The spindles have six splines. The spindle sleeve is of machinery steel with teeth cut integral, and both spindle sleeve and sleeve housing are bronze bushed.

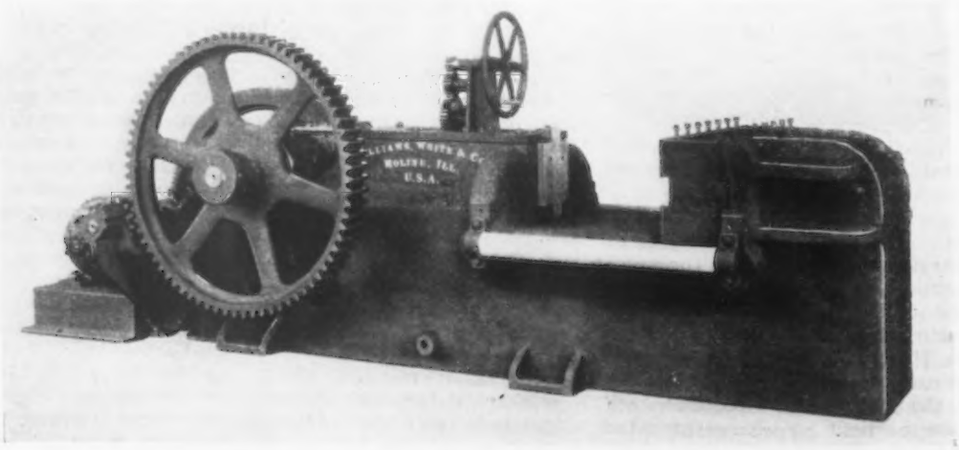
The quick-change geared feed unit is inclosed within the main frame of the machine, the usual feed box with worm and worm gear being eliminated. Eight changes of spur geared feed, from 0.0055 to 0.62 in., are regularly obtainable, but slip gears can be supplied for other feeds. Feeds are controlled by levers conveniently located at the front of the machine. Eight spindle speeds, from 64 to 708 r.p.m., are regularly provided. Higher speeds may be secured by running the drive shaft faster.

Equipped with a 15-hp. driving motor, the six-spindle machine, here illustrated, weighs 19,700 lb.

Bending and Straightening Machines for Railroad and Structural Shops

Two bending and straightening machines, with capacity for bending 110 lb. and 130 lb. rails, respectively, are being marketed by Williams, White & Co., Moline, Ill. The larger machine, designated as the No. 2-A and illustrated herewith, may be employed also for bending 15-in. I-beams in a horizontal plane and 24-in. I-beams in a vertical plane.

The principal dimensions of the No. 2-A bender are as follows: Stationary jaw face, 16x50 in.; jaw opening, 30½ in.; ram face 11¼x11¼ in.; stroke, 1¾ in.; and adjustment, 8½ in. The power required is



The Capacity Is for Bending 130-Lb. Rails, Also 15-In. I-beams in the Horizontal Plane and 24-In. I-beams in the Vertical Plane

10 hp. The principal dimensions of the smaller machine, designated as the 2-P bender are: Stationary jaw face, 16x45 in.; jaw opening, 24½ in.; slide face, 11¼x11¼ in.; stroke, 1¾ in.; and total adjustment, 8½ in. The power required is 7½ hp.

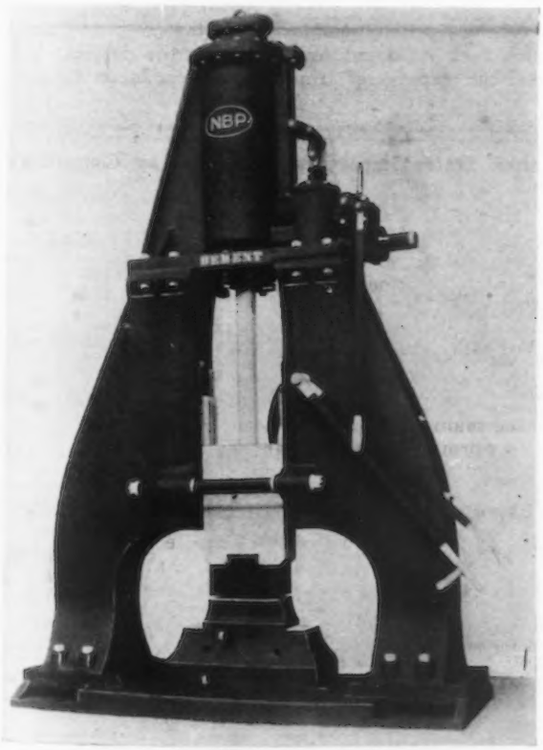
Both machines can be arranged either for direct belted or direct-geared motor drive. They may also be arranged for operation continuously, without clutch control, as in the case of the machine illustrated. When clutch control is desired, the clutch provided is of the company's automatic stop design and is equipped with backlash pins.

IMPROVED STEAM HAMMER

Increased in Speed of Operation Attributed to Valve and Steam Passage Design

A NEW line of double-frame steam hammers, of improved design, has been announced by the Niles Tool Works Co. division of the Niles-Bement-Pond Co., 111 Broadway, New York. The line includes hammers ranging in capacity from 3500 to 8000 lb., the 4000-lb. unit being illustrated herewith.

Increase of more than 30 per cent in speed of operation, as compared with the former machines, is attributed to the improved valve and steam passage design. The use of forged and cast steel has been adopted as far as possible for the main members, and the design of cylinder and frames has been changed to secure additional strength and symmetrical appearance.



Forged and Cast Steel Has Been Adopted as Far as Possible for the Main Members. The hammers range from 3500 to 8000 lb. in capacities

The hammer is of the double-acting type. The length of stroke, position, speed, and intensity of blows are controlled either automatically or by hand by two levers, one controlling the operating and the other the throttle valve. The cylinder is a steel casting fitted with a cast-iron renewable liner, pressed into position, and is lipped down between the frames and held to them by eight bolts fitted into reamed holes. The bolts are of alloy steel.

Throttle and operating valve chests are cast integral with the cylinder, and the whole unit is self draining. A safety cover is bolted on top of the cylinder and contains two heavy helical springs with bumpers projecting into the cylinder which act as a cushion, so placed as to come in contact with the piston at its highest position. Springs are also furnished on the under side of cylinder for the same purpose. A pump is provided for adequate lubrication of cylinder unit. The operating valve is of the balanced-piston type and works in a renewable liner fitted in the cylinder. The vertical motion of the valve, by which steam is admitted, cutoff and exhausted, is by a cam bearing on an incline in the ram. As there is no rigid connection, the valve and gear are not subjected to violent shocks. The throttle valve is of rotary type, operated by a lever to admit steam through the center.

The piston is of nickel steel and is forged integral with the rod. It can be raised above the top of the cylinder for examination or renewal of rings without separating the ram from the rod. The ram is of carbon forged steel. The piston rod is fitted into a taper hole in the ram and a safety pin is provided to hold ram and rod together.

The frames are heavy steel castings of box section. Greater depth of section and improved appearance are attained by the elimination of the usual curved frame design and the employment of a straight line profile blending into a large radius toward the hammer base. They are lipped in the base and held together by tie bolts and distance pieces. They are held down on base plate by eight large alloy-steel bolts, fitted in reamed holes.

The guides have a shoulder at the bottom so arranged that they cannot move vertically, but are free for horizontal adjustment by means of wedges which can be suitably locked after adjustment is made. Guides and wedges may be removed without separating ram from piston rod. The guide bolts are held to the guides by pins, and as these bolts are not required to carry the weight of the guide, they are free from vibration and crystallization is therefore eliminated.

The anvil is a close-grained iron casting entirely independent of the base plate. The anvil cap is an annealed open-hearth steel casting, is keyed to the anvil and can be removed without disturbing the hammer. The anvil is provided with a tongue instead of the usual notch and the anvil cap is notched at the bottom to correspond. Being of steel, the anvil cap offers greater resistance to breakage, but if damage should result, replacement can be made more cheaply and conveniently than a broken anvil.

Great Britain Buys High-Production Machine Tools from America

Machine tools imported by Great Britain from the United States in 1912 and 1913 averaged 89 per cent of the total import tonnage of machine tools and 91 per cent of total value. Shipments received from Germany at the same time averaged 3 per cent in both tonnage and value. In 1926 the United States supplied 34 per cent of the total tonnage and 60 per cent of the value, while Germany supplied 56 per cent of the tonnage and 32 per cent of the value.

Great Britain imported 5773 gross tons of machine tools in 1926, valued £764,625, or an average of £132 per ton. Of this amount the United States furnished 1962 tons, valued at £455,040, or an average of £232 per ton. Germany furnished 3257 tons, valued at £241,226, or an average of £74 per ton. It is in high-production machines that the United States holds the lead, as neither British nor German makers have been able to duplicate the American high-production machine tools.

The directors of the United States Steel Corporation have authorized a donation of $75,000 to the $1,500,000 general building fund of the St. Francis Hospital, Pittsburgh, for which a campaign now is in progress. The contribution has been made in the name of the H. C. Frick Coke Co., the Carnegie Steel Co., the National Mining Co., the Bessemer & Lake Erie Railroad, and the Pittsburgh Limestone Co.

Exports Higher; Imports Lower

April the Best Export Month Since January—Ten-Month Total 17 Per Cent Above Last Year—Imports Second Lowest Since November, 1924

WASHINGTON, May 28.—The substantial gain in exports of iron and steel products from the United States in April over those for March was due principally to the greater movement of scrap and of steel tubular goods. These two classes provided 49,792 tons of the April foreign shipments of 192,339 gross tons, which, as stated in THE IRON AGE of May 26, exceeded March exports by 21,245 tons. For the ten months ended April 30 exports amounted to 1,891,096 tons, reflecting the sharp gain of 275,160 tons over the corresponding period of last year, when exports were 1,615,936 tons. For the four months ended April 30 exports totaled 744,796 tons, an increase of 49,118 tons over the corresponding period of 1926, with a total of 695,678 tons. April imports declined to 60,374 tons, as against 61,872 tons in March.

Among the items whose exportation showed a heavy decrease in April as against March was tin plate, the respective totals being 18,159 and 26,817 tons. In addition to scrap and tubular products, substantial gains were made in April over March in wire rods, black steel sheets, structural material and barbed wire and woven wire fencing.

Where the Steel Went

Of the April shipments, 88,645 tons went to Canada, which took its usual first place as the destination of American exports of iron and steel. Japan remained

Sources of American Imports of Iron Ore

(In Gross Tons)

	April		Ten Months Ended April	
	1927	1926	1927	1926
Canada	478	586	13,981	6,237
Cuba	44,000	39,350	453,500	414,362
Chile	130,300	139,800	1,110,900	1,074,800
Spain	196	174	17,312	90,862
Sweden	19,934	....	102,742	105,744
French Africa	38,925	14,300	302,304	111,586
Other countries	5,737	521	238,171	65,543
Total	239,570	194,731	2,238,910	1,869,133

Imports of Iron and Steel Into the United States

(In Gross Tons)

	April		Ten Months Ended April	
	1927	1926	1927	1926
Pig iron	8,923	54,359	157,600	427,988
Ferromanganese*	2,153	5,235	29,442	50,991
Ferrosilicon†	1,179	1,714	12,148	4,836
Ferro-chrome‡	11	....	563	....
Scrap	5,500	3,317	75,979	70,525
Pig iron, ferroalloys and scrap	*17,766*	*64,625*	*275,732*	*554,340*
Steel ingots, blooms, billets and slabs	617	1,448	16,429	17,849
Iron blooms, slabs, etc.	....	13	306	779
Wire rods	707	783	9,799	7,027
Semi-finished steel	*1,324*	*2,244*	*26,534*	*25,655*
Rails and splice bars	852	10,015	32,020	30,080
Structural shapes	11,796	8,553	121,810	59,438
Boiler and other plates	1,336	63	4,045	1,748
Sheets and saw plates	1,191	769	11,975	3,538
Steel bars	8,840	8,582	80,868	58,747
Bar iron	659	757	4,447	6,138
Hoops, bands and cotton ties	1,837	1,900	26,407	10,186
Tubular products (wrought)	3,575	1,976	34,666	28,343
Nails, tacks, staples	532	361	5,226	3,145
Tin plate	38	1,327	318	1,636
Bolts, nuts, rivets and washers	13	69	207	260
Round iron and steel wire	456	433	3,630	3,575
Barbed wire	328	172	3,118	5,717
Flat wire; strip steel	277	238	2,871	2,079
Steel telegraph and telephone wire	1	....	1,071	215
Wire rope and strand	361	172	2,231	1,293
Other wire	98	205	640	1,090
Wire cloth and screening	....	37	281	333
Rolled and finished steel	*32,190*	*35,629*	*335,831*	*217,561*
Cast iron pipe	8,738	5,040	88,479	48,168
Castings and forgings	356	98	2,610	2,111
Total	60,374	107,636	729,186	847,835
Manganese ore*	29,704	59,666	278,529	335,459
Iron ore	239,570	194,731	2,238,910	1,869,133
Magnesite (dead burned)	7,785	8,534	43,380	52,939

*Manganese content. Shipments of manganese ore from Cuba, which are not included in the table, totaled 158 gross tons in April.
†Silicon content.
‡Chromium content.

United States Imports of Pig Iron by Countries of Shipment

(In Gross Tons)

	April		March	
	1927	1926	1927	1926
United Kingdom	2,048	15,651	1,250	12,250
British India	2,149	9,798	2,763	14,558
Germany	285	13,529	690	13,900
Netherlands	3,636	8,330	2,585	9,231
Canada	271	939	56	559
France	....	5,051	....	2,150
Belgium	200	650	100	1,733
Norway	....	2	....	....
All others	334	409	48	444
Total	8,923	54,359	7,492	54,825

Exports of Iron and Steel from the United States

(In Gross Tons)

	April		Ten Months Ended April	
	1927	1926	1927	1926
Pig iron	3,753	2,010	29,653	28,111
Ferromanganese	10	2	530	1,586
Scrap	24,395	13,759	93,671	76,728
Pig iron, ferroalloys and scrap	*28,158*	*15,771*	*123,854*	*106,425*
Ingots, blooms, billets, sheet bar, skelp	7,978	5,966	91,855	72,708
Wire rods	770	1,201	15,826	14,969
Semi-finished steel	*8,748*	*7,167*	*107,681*	*87,677*
Steel bars	9,209	13,096	110,417	105,081
Alloy steel bars	445	508	4,211	3,352
Iron bars	365	509	4,755	3,114
Plates, iron and steel	14,954	10,397	114,307	93,649
Sheets, galvanized	14,947	17,746	149,606	134,288
Sheets, black steel	11,724	17,760	149,267	120,120
Sheets, black iron	1,259	1,328	14,376	16,511
Hoops, bands, strip steel	3,660	4,082	38,325	39,492
Tin plate; terne plate	18,159	22,124	268,062	156,108
Structural shapes, plain material	13,380	11,616	119,728	105,428
Structural material, fabricated	5,303	7,936	54,693	73,750
Steel rails	13,919	15,859	186,699	121,384
Rail fastenings, switches, frogs, etc	2,999	2,613	31,732	33,433
Boiler tubes, welded pipe and fittings	26,402	25,910	264,159	227,628
Plain wire	3,019	3,358	22,061	30,189
Barbed wire and woven wire fencing	5,289	5,997	33,060	55,229
Wire cloth and screening	142	141	1,701	1,622
Wire rope	481	947	3,743	4,338
Wire nails	627	1,242	7,927	9,920
Other nails and tacks	758	738	5,679	7,547
Horseshoes	78	30	482	597
Bolts, nuts, rivets and washers, except track	1,081	1,471	9,926	13,381
Rolled and finished steel	*148,200*	*165,408*	*1,594,916*	*1,336,761*
Cast iron pipe and fittings	1,644	2,502	23,490	25,805
Car wheels and axles	1,347	1,175	12,326	14,004
Iron castings	1,102	673	8,851	8,426
Steel castings	1,206	1,151	5,523	4,946
Forgings	493	237	2,892	2,025
Castings and forgings	*5,792*	*5,738*	*53,082*	*55,206*
All other	1,441	365	11,563	10,467
Total	192,339	194,449	1,891,096	1,615,936

in second place, taking 11,941 tons. Italy was third with 8928 tons.

Of the 18,159 tons of tin plate exported in April, Canada took 4483 tons; Japan, 2477 tons; Argentina, 3602 tons, and Italy, 1409 tons. Canada took 11,548 tons of plates of the total April movement of 14,954 tons. Of the 14,947 tons of galvanized sheets exported that month Canada took 4754 tons, the Philippine Islands, 1787 tons, and Colombia, 1020 tons. Canada also was by far the leading destination of black sheets in April, taking 6653 tons of the 11,724 tons exported. Japan took 3760 tons of this product. Of the 9209 tons of steel bars exported in April, Canada took 5827 tons, or almost 65 per cent, and took a still greater proportion, about 87 per cent, of plain heavy structural material, 11,011 tons of the 13,380 tons going to that country. Canada took 4844 tons of the 13,919 tons of steel rails exported in April, while China ranked second as the source of rail exports that month, taking 1770 tons.

Imports of Iron and Steel Products Into the United States by Countries of Origin

(In Gross Tons)

	April, 1927	March, 1927	April, 1926
Austria	146	91	93
Belgium	17,775	20,408	20,575
Czechoslovakia	10	44	22
Estonia	52	....	....
France	13,248	10,250	12,661
Germany	7,804	10,118	18,578
Italy	....	199	....
Netherlands	4,024	2,954	11,591
Norway	....	994	2,505
Poland and Danzig	213	....	....
Russia	....	....	4,619
Sweden	2,381	1,898	2,101
United Kingdom	6,153	4,096	19,208
Other Europe	18	133	341
Europe	*51,824*	*51,185*	*92,294*
Canada	6,224	5,695	8,746
Cuba	....	2,188	....
Mexico	54	32	....
Panama	....	....	1,114
French West Indies	120	....	....
British India	2,149	2,763	9,798
Hongkong	2	....	....
Japan	1	2	....
All others	....	7	303
Total	60,374	61,872	112,255

Destination of Iron and Steel Products Exported from the United States

(In Gross Tons)

Country of Destination	April, 1927	January Through April 1927	January Through April 1926
North and Central America and the West Indies	*109,694*	*351,939*	*347,460*
Canada and Newfoundland	88,701	270,764	252,740
Cuba	5,837	27,757	32,887
Mexico	7,046	26,864	33,403
Guatemala	665	3,209	6,079
Salvador	524	1,771	5,096
Panama	2,200	6,099	3,096
British West Indies	2,427	5,453	2,771
Other West Indies	947	4,920	5,910
Other Central America	1,347	5,102	5,478
South America	*27,275*	*137,949*	*120,132*
Argentina	5,596	30,379	24,216
Brazil	6,732	31,511	13,756
Chile	3,085	9,187	18,831
Colombia	2,863	25,563	20,985
Peru	5,802	9,758	14,412
Venezuela	2,388	25,571	24,345
Other South America	809	5,980	3,587
Europe	*20,654*	*55,682*	*50,797*
France	509	1,179	5,913
Italy	8,928	13,036	15,126
Rumania	225	1,010	1,515
Russia	916	2,065	2,802
Turkey	105	809	636
United Kingdom	5,586	25,655	18,146
Other Europe	4,385	11,928	6,659
Far East	*32,600*	*192,647*	*172,213*
Australia	3,449	11,225	7,670
British Malaya	567	4,817	4,062
China	2,803	25,056	12,011
Dutch East Indies	3,966	15,991	12,825
India	1,471	13,030	12,534
Japan and Chosen	11,941	92,689	96,265
Kwangtung	2,393	6,910	3,531
Philippine Islands	4,984	16,439	20,698
Other Asia and Far East	1,026	6,490	2,617
Africa	*2,116*	*6,579*	*5,076*
British South Africa	1,014	2,527	2,088
Egypt	270	1,681	2,189
Portuguese East Africa	705	1,854	635
Other Africa	127	517	164
Total	192,339	744,796	695,678

Japan, for the first time in a long period, did not take any.

Of the April imports, Belgium in April took the lead from Germany as the source of these shipments, providing 17,775 tons. France also passed Germany, supplying 13,248 tons, while Germany, in third place, furnished 7804 tons. Of the 8923 tons of pig iron imported in April, the Netherlands was credited with first place as the source, providing 3636 tons, while British India, in second place, furnished 2149 tons. The United Kingdom supplied 2048 tons. Of the 29,704 tons of manganese concentrates imported in April, 21,072 tons came from Soviet Russia, while 2307 tons came from British India.

When compared with corresponding periods of one year ago there are remarkable declines in imports. In April of last year they amounted to 107,636 tons, or 47,262 tons greater than this year. For the ten months ended April, 1926, imports aggregated 847,805 tons, or 118,614 tons more than the 729,191 tons for the corresponding period of the current year. For the four months ended April of last year imports, amounting to 147,175 tons, exceeded by 22,354 tons the 124,821 tons imported during the corresponding period of 1927.

James L. Stuart, of the Mellon-Stuart Co., acting for the Koppers Co., Pittsburgh, has acquired most of the property on Seventh Avenue between Grant Street and William Penn Way, Pittsburgh, and borings already have been started preparatory to the erection of a 22-story building to house the business activities of the Koppers Co. and its subsidiaries.

Exports of Iron and Steel in Gross Tons

	All Iron and Steel	Pig Iron	Semi-Finished Material
*Average, 1912 to 1914	2,406,218	221,582	145,720
*Average, 1915 to 1918	5,295,333	438,462	1,468,020
*Average, 1919 to 1921	3,804,910	185,315	162,048
*Average, 1922 to 1924	1,927,988	34,906	124,789
Calendar year 1925	1,762,571	32,674	108,681
January, 1926	174,585	1,663	4,388
February	157,187	1,478	5,615
March	169,438	1,489	6,050
April	194,449	2,010	7,167
May	173,418	1,107	9,880
June	159,506	1,369	5,714
Fiscal year 1926	1,948,860	30,587	103,271
July	194,717	2,595	14,558
August	171,588	2,744	14,437
September	182,071	2,173	12,569
October	172,070	2,205	13,983
November	219,830	3,724	17,528
December	198,189	2,651	10,412
Calendar year 1926	2,167,048	25,208	120,602
January, 1927	215,235	3,734	5,531
February	166,129	2,466	3,935
March	171,094	3,647	7,782
April	192,339	3,753	8,748
Ten months	1,891,089	29,653	107,681

*Calendar years.

Imports of Iron and Steel in Gross Tons

	Total Imports	Pig Iron	Ferro-alloys	Manganese Ore and Oxide*
Calendar year 1922	714,224	383,445	109,084	374,451
Calendar year 1923	734,599	367,820	100,120	206,048
Calendar year 1924	556,814	209,109	59,910	255,157
Calendar year 1925	943,240	441,425	80,269	265,688
January, 1926	79,067	48,423	3,105	37,421
February, 1926	100,273	59,122	5,194	27,239
March	93,107	54,825	4,606	27,391
April	107,636	54,359	6,949	59,666
May	108,731	57,211	3,002	21,633
June	124,215	43,106	5,277	31,315
Fiscal year 1926	1,080,781	528,305	64,106	388,407
July	82,411	32,206	1,702	34,133
August	91,578	26,538	4,611	41,075
September	85,484	17,508	2,525	18,167
October	81,830	18,847	4,879	13,331
November	81,259	17,560	6,057	20,091
December	75,559	14,783	8,752	26,971
Calendar year 1926	1,111,090	445,602	56,809	354,223
January, 1927	63,452	9,326	2,517	50,605
February	49,460	4,417	2,968	21,585
March	61,872	7,492	4,611	22,917
April	60,374	8,923	3,343	29,704
Ten months	729,186	157,600	42,153	278,529

*Not included in "total imports." These figures are for manganese contents of the ore.

British Curtailing Tin Plate Output

More Mills to Suspend—European Markets Inctive—Armco Sheets to Be Made in Germany and Austria—American Export Prices Low

LONDON, ENGLAND, May 30.

(By Cable)

PIG iron is still quiet, but there is less demand for foreign grades. Consumers are buying from hand to mouth, anticipating still further price reductions, but Cleveland makers are inclined to curtail output, although no foundry furnaces have yet been banked.

Hematite prices are weak and output has been reduced by Gjers, Mills & Co., Ltd., damping three of their Ayresome furnaces, reported in last week's cable. Foreign ore continues quiet. There is improved demand for ferromanganese and British makers are well sold ahead.

Finished steel is quiet, particularly demand for plates, but section material is fairly active in both the domestic and export markets.

Tin plate is quiet, but inquiry is broadening, while production has been curtailed and the cost of foreign sheet bars has increased. More mills are expected to close at Whitsun week end. Galvanized sheets are moderately active. There is a good demand for Japanese specification thin gage black sheets and makers have advanced prices 5s. per ton ($1.21).

Continental steel is inactive, consumers believing values cannot be maintained, but works showing considerable firmness. British tin plate mills are buying semi-finished for early shipment whenever possible, but sheet rollers have large supplies.

The International Steel Cartel meets June 10, to discuss the establishment of a central sales organization for semi-finished material and beams. The wire rod cartel has advanced prices of wire rods to £5 7s. 6d. ($26.07) per ton for 1000-ton lots and £5 10s. ($26.67) per ton for lots of less than 1000 tons. On May 1, there were 41 Luxemburg blast furnaces active.

IMPORTED STEEL IN DEMAND

Open-Hearth Bars for New York Subway Go to Germany—American Export Prices Low

NEW YORK, May 31.—Importers of European steel report a fair volume of business in various products, although the price of foreign material is slightly higher than a few weeks ago. Current quotations on continental plain steel bars, Thomas grade, are about 1.70c. per lb., base, with open-hearth quality at about 1.80c. per lb., base, and reinforcing bars 5c. per 100-lb. higher. These are the quoted prices of importers, but on desirable contracts, several of which have closed lately, considerably less is generally done.

On a recent purchase by the Board of Transportation, New York, for new subway work, 1000 tons of open-hearth reinforcing bars is reported to have gone to the agent in New York for the Friedrich Krupp A. G., Essen, Germany, at about 1.69c. per lb., the usual differentials for size being disregarded. About 600 tons of bars for the approach in New Jersey to the Holland vehicular tunnel under the Hudson River went to an importer representing Ferrostahl, the export house of Gutehoffnungshütte, at Oberhausen in the Rhineland. An inquiry for more than 2000 tons of open-hearth reinforcing bars for a sewage contract in Philadelphia brought out competition from importers and the business is reported to have been placed with a Pittsburgh mill at 1.58c. per lb., base Pittsburgh, except for about 200 tons awarded to a European mill. While this was slightly higher than the offers of foreign makers, the better distribution of deliveries was evidently preferred.

American Export Prices Low

Export offers of American mills are apparently reaching low levels. While steel bars are generally quoted for export at about 1.50c. to 1.55c. per lb., base Pittsburgh, and a sizable tonnage is reported to have been closed for shipment to Porto Rico at this base price, as low at 1.35c. per lb., base, is said to have been done by one seller. Tin plate prices are still low with about $4.50 to $4.60 per base box, Pittsburgh, the usual

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.85 per £ as follows:

Durham coke, del'd.	£1	2s.	to £1	2½s.	$5.33	to	$5.46
Bilbao Rubio ore†	1	2	to 1	2½	5.33	to	5.46
Cleveland No. 1 fdy.	3	12½			17.57*		
Cleveland No. 3 fdy.	3	10			16.97*		
Cleveland No. 4 fdy.	3	9			16.73*		
Cleveland No. 4 forge	3	8½			16.61*		
Cleveland basic	3	15	to 3	15½	18.18	to	18.30
East Coast mixed	3	19	to 3	19½	19.15	to	19.27
East Coast hematite	4	0½			19.52		
Rails, 60 lb. and up.	7	15	to 8	5	37.58	to	40.01
Billets	7	5	to 7	10	35.16	to	36.37
Ferromanganese	12	0			58.20		
Ferromanganese (export)	11	15			56.98		
Sheet and tin plate bars, Welsh	6	5			30.31		
Tin plate, base box	0	19	to 0	19¼	4.60	to	4.66
Black sheets, Japanese specifications.	14	0	to 14	5	67.90	to	69.11
					C. per Lb.		
Ship plates	7	12½	to 8	0	1.65	to	1.73
Boiler plates	11	0	to 11	10	2.38	to	2.49
Tees	8	5	to 8	15	1.78	to	1.89
Channels	7	10	to 8	8	1.62	to	1.73
Beams	7	5	to 7	15	1.57	to	1.68
Round bars, ¾ to 3 in.	8	0	to 8	10	1.73	to	1.84
Steel hoops	10	10	to 11	0	2.28	to	2.39
Black sheets, 24 gage	11	5			2.44		
Galv. sheets, 24 gage	14	12½	to 14	15	3.17	to	3.19
Cold rolled steel strip, 20 gage, nom.	14	0			3.03		

*Export price, 6d. (12c.) per ton higher.
†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)							
Belgium	£3	2s.	to £3	3s.	$15.03	to	$15.28
France	3	2	to 3	3	15.03	to	15.28
Luxemburg	3	2	to 3	3	15.03	to	15.28
Basic pig iron:							
Belgium	3	2	to 3	3	15.03	to	15.28
France	3	2	to 3	3	15.03	to	15.28
Luxemburg	3	2	to 3	3	15.03	to	15.28
Coke	0	18			4.37		
Billets:							
Belgium	4	10	to 4	11	21.82	to	22.06
France	4	10	to 4	11	21.82	to	22.06
					C. per Lb.		
Merchant bars:							
Belgium	4	15	to 4	16	1.04	to	1.05
Luxemburg	4	15	to 4	16	1.04	to	1.05
France	4	15	to 4	16	1.04	to	1.05
Joists (beams):							
Belgium	4	16	to 4	17	1.05	to	1.07
Luxemburg	4	16	to 4	17	1.05	to	1.07
France	4	16	to 4	17	1.05	to	1.07
Angles:							
Belgium	4	15			1.04		
⅛-in. plates:							
Belgium (nominal)	6	0	to 6	1	1.32	to	1.33
Germany (nominal)	6	0	to 6	1	1.32	to	1.33
⅞-in. ship plates:							
Belgium	5	17			1.28		
Luxemburg	5	17			1.28		
Sheets, heavy:							
Belgium	6	3	to 6	4	1.35	to	1.36
Germany	6	3	to 6	4	1.35	to	1.36

(a) Nominal.

quotations and actual sales occasionally reported down to $4.25 per base box, Pittsburgh. The export market on sheets is still at about $81 per ton, c.i.f. Japan, for light gage black sheets, 13 to the bundle. Recent firm offers from Japan of about $78 per ton, c.i.f., however, have brought out counter offers by the sellers that are slightly under $80 per ton, c.i.f. Japan. About 1000 tons of light gage black sheets is reported to have been offered for export recently, by an American mill, being disposed of by two Japanese export houses, which secured offers from Japanese merchants.

Since Suzuki & Co., the large Japanese import and export company, began liquidation, current orders booked by that company have been turned over to other export houses for execution and a recent transfer of business involves about half the pig iron consumption of Japan. This is the contract with Indian furnaces, primarily the Tata Iron & Steel Co., under which Suzuki & Co. formerly imported from India for Japanese consumers, about 700,000 tons of pig iron annually. In the future Mitsui & Co. will handle this importation of iron for Japanese users, the remaining 50 per cent of Japan's requirements being satisfied by domestic producers.

Large Japanese Sheet Mill to Be Sold

The recent reports that the Kawasaki Dockyard Co., Kobe, Japan, was in financial difficulties have been followed by the information from Japan that the company will probably be sold to two other Japanese interests. When the financial troubles of the Kawasaki Dockyard Co. became known to the employees, they offered K. Matsukata, president of the company, to work one extra hour a day without compensation, as an aid in reduction of costs. The services of S. Goh, one of the leading financial men of Japan, president and director of a number of companies, were secured to reorganize the Kawasaki company finances and the result is evidently the recently cabled report of the expected sale. Under this plan, the Mitsui interests will purchase the shipyard and merge it with their own shipbuilding department, probably incorporating it later as the Mitsui Shipbuilding & Drydock Co. The other departments of the Kawasaki company, apparently including the sheet mills, which have the largest capacity in Japan, are reported going to the Sumitomo interests, owners of a number of large Japanese companies, including the Sumitomo Copper Mining Co., the Sumitomo Copper & Steel Tube Mfg. Co. and the Sumitomo Bank.

Business with Japan continues small. There is some inquiry for tin plate and two inquiries for heavy rails are reported in preparation, which will total together about 20,000 tons, one being for about 60 miles and the other for about 80 miles. The inquiry from the Imperial Government Railways for 10 sets of manganese steel switches, awarded a month or more ago, was withdrawn and on a recent reopening of bids the business went to Youei & Co., a Japanese company representing Hadfields, Ltd., Sheffield, England.

RAIL FAILURES IN EUROPE

Damage to Head and by Transverse Fissure Comparable to Condition in United States

HAMBURG, GERMANY, May 12.—Failure of rails on the roads of four different European countries, on the basis of 4716 miles, averaged from the total mileage and failures reported, in order to make the results comparable with the figures presented in the article by C. W. Gennet, Jr., "A Call For Better Steel Rails," in THE IRON AGE, April 14 (page 1093), shows some interesting differences.

In Germany, during 1926, on an average 4716 miles there were 2220 failures of rails, of which 17 per cent were transverse fissures, 56 per cent of the head type and the remainder smaller injuries to the rails. In Italy, of 4716 miles of track, there were 2910 failures, of which 19.4 per cent were transverse fissures, 69 per cent of the head type and the remainder other damages. In Czechoslovakia, of 4716 miles, there were 2848 failures, of which 22 per cent were cases of transverse fissures and 61 per cent of the head type, the remainder being from other causes. In Rumania on an average of 4716 miles there were 4160 failures of rails, 27 per cent of which were transverse fissures, 68 per cent of the head type and the remainder from other causes.

The high rate of failure in Rumania is due to the fact that since 1914 there has been practically no repair to existing lines. On this basis, Russia and Poland should have the highest rates. A recent statement in a Polish paper states that on 200 kilometers (124.20 miles) there were 250 failures of rails in one year.

(In the article by C. W. Gennet, Jr., it was pointed out that on one prominent midwestern railroad there were, in one year, on 4716 miles of track, 2700 failures, of which 21 per cent were transverse fissures and 65 per cent of the head type.—Editor.)

Germany and Austria to Manufacture Under Armco Patents

HAMBURG, GERMANY, May 12.—The German Steel Union has completed negotiations with the American Rolling Mill Co., Middletown, Ohio, for the rights to manufacture Armco iron products in Germany. The right to manufacture covers both Germany and Austria.

JAPAN MAY RECOVER BY FALL

Cotton and Silk Business Stable—Financial Troubles of Kawasaki Dockyard May Increase Sheet Imports

KOBE, JAPAN, May 5.—In a résumé of financial and market conditions in Japan, E. W. James, managing director, A. Cameron & Co., Ltd., Kobe, points out that despite the recent serious financial state of affairs there is an optimistic angle from which the situation may be viewed.

Japan's spinning mills are now strongly overbought on raw cotton at prices which must be fully 15 per cent under today's market. The situation in China may improve during the next three months, which would mean a very substantial improvement in Japan's export position. The raw silk shipments to the United States have kept up well and there is every indication that this year will be a record for exports of valuable commodities. It is just possible, therefore, that conditions may take a favorable turn during the autumn. There is a belief that the shake-up during April was badly needed and will eventually prove profitable and of great benefit to Japan, although we now have before us a few weeks of great uncertainty.

The market on black sheets is steady as a result of reduced stocks and the revival in consumption from the rural districts. It is worthy of note that the Kawasaki Dockyard Co., the largest producer of black sheets in Japan, is in financial difficulties, and readjustments in the company's affairs may make it necessary for it to discontinue the manufacture of black sheets. Should it be necessary for the Kawasaki Dockyard Co. to suspend operation there would be an immediate resumption of buying from European and American mills. At the end of April, Eagle brand black sheets, 13 to the bundle, were selling at 75.50 sen (35.10c) per sheet and British Raven brand were offered at 74 sen (34.41c) per sheet.

In the past, the large tin plate consumers, with a few exceptions, have satisfied their requirements from local merchants, who always maintained good stocks. During the past few months, however, such consumers have been contracting with importers for forward deliveries, and as these shipments arrive the local dealers, becoming alarmed, dump their stocks on the market. As a result, the local prices of tin plate are, lately, considerably under the replacement values. The moratorium, of course, upset the market and improvement in local prices is not expected until some of the merchants who are in financial difficulties have cleared

their stocks. At the end of April American primes were selling at 22.50 yen ($10.47) per box of 170 lb. and 12.50 yen ($5.83) per box of 100 lb. British primes sold at 22.40 yen ($10.42) per box of 170 lb. and 12.10 yen ($5.63) per box of 100 lb.

The market on wire rods and wire nails is almost exclusively based on the continental prices. Continental wire rods were quoted at the end of April at 83 yen ($38.60) per ton. As manufacturers of wire have covered their season's requirements the market is quiet and prices declining. In sympathy with the wire rod market the price of wire nails also declined in April, but stocks are not considered large and an early advance in price is expected. At the end of April, Japanese nails were quoted at 7.80 yen ($3.63) per keg and continental nails at 7.30 yen ($3.40) per keg.

In structural material, which is also, almost exclusively, secured from European sources, there is absolutely no evidence of immediate improvement. The accumulation of stock is in excess of the estimated consumption and leading merchants, who possess large quantities of all sizes, are at the mercy of buyers. This increase in stocks is the result of the assumption that the government would increase the tariff this spring. As the financial position of many holders of these stocks is unsound, it has necessitated their sacrificing the material to meet their bills at the banks.

Spain Legislates Against Foreign Motor Cars

MADRID, SPAIN, May 10.—A new law governing public operation of automobiles is evidently designed to eliminate, as far as possible, the use of foreign made cars. Under it the Government has decided that all taxicabs, owned by companies or individuals and rented motor cars shall be of Spanish manufacture, unless the price of the imported car, plus the duty, does not exceed the price of the domestic automobile by more than 10 per cent. Should 75 per cent of the raw materials used in a car be of Spanish origin, the law provides that no taxes need be paid for the next three years. If the price of such cars exceeds 15,000 pesetas ($2,634), half the amount of the taxes will be collected. This law is expected to seriously curtail imports of foreign cars, principally from the United States and may result in closing many of the assembling plants for American cars, which have been established in Spain.

New Reinforcing Bars Developed in Austria

HAMBURG, GERMANY, May 12.—An Austrian company, the Internationale Stegdecken Betonbaugesellschaft at Vienna, has developed a reinforcing bar, which is known under the brand name of Isteg. Used in the reinforcement of concrete, the new bars are claimed to increase the tensile strength of the concrete about 43 per cent. More than 100 tests are said to have been made and the bars are now being used in buildings. The cost of these bars is about 4 per cent higher than other reinforcing bars, but it is claimed that about 22 per cent can be saved in the tonnage of material used. The fact that the new bars evidently offer a saving of about 18 per cent in building costs is creating considerable interest in the reinforced concrete building field.

German Films of Machinery to Be Shown in Russia

HAMBURG, GERMANY, May 10.—A contract has been signed between the Russian Government agricultural department and the German motion picture company, Deulig A. G., under which the department will distribute in Russia short films dealing with agricultural machinery and explaining its use and advantages. By this means it is intended to stimulate the purchase of German agricultural machinery in Russia. The films will be furnished without charge and it is understood they are to be paid for by various German agricultural machinery manufacturers.

Railroads Have Fewer Cars with Greater Capacity

ATLANTIC CITY, N. J., May 31.—Expressing the belief that it is possible to handle traffic of the United States with a further decrease in the ownership of open-top and box cars of at least 100,000, the board of directors of the American Railway Association at a meeting here on Friday of last week approved a report submitted by the Car Service Division of the association. The report called attention to the fact that present efficiency in the use of freight cars is the greatest ever attained.

"The placing in service of 602,507 modern high-capacity cars, either new or rebuilt, the retirement from service of 545,238 low-capacity, inefficient cars and also the placing in service of 10,862 locomotives since Jan. 1, 1923, has without doubt been the principal outstanding cause of this increased efficiency," the report said.

The railroads have fewer freight cars and locomotives than they had at this time last year, but the potential and effective capacity of the equipment is greater. In the case of freight cars, the average capacity today is 45.33 tons, compared with 44.87 tons last year and 43.10 tons in 1923. The average tractive power of locomotives also is now about 10 per cent greater than in 1923, but their coal consumption is less. Fewer freight cars and locomotives now are in need of repair than at this season in any previous year. Greater efficiency also was brought about, the report said, by better distribution of cars.

Concerning the outlook as to traffic for the present year the Car Service Division estimated the revenue freight loading for the 52 weeks of 1927 at 52,762,737 carloads compared with 53,308,753 carloads in 1926, or a decrease of 546,016 carloads. This decrease was held to be due principally to the exceptionally heavy movement of export coal to England in 1926 and the curtailed output of bituminous coal in 1927. In making the estimate no consideration was given to the possible effects of the Mississippi River flood on the total car loadings of the year.

"Demands for open-top cars for the handling of steel, sand, stone and gravel will be as heavy at least as during 1926," the report said, "and in all probability will be slightly heavier."

Grey Mill at Lackawanna Working Into Schedule Production

Bethlehem's new Grey mill at its Lackawanna plant, which began operations in April, is unusual in many respects, being one of the most highly powered mills in the world. It is electrically driven in every detail, and the mill proper consists of three units: A 54-in. reversing blooming mill; a 48-in. reversing roughing mill; a 48-in. reversing finishing mill.

All three mills are arranged in tandem and are designed to cover a schedule of the full range of Bethlehem beams, girders and columns. The electrical equipment for the main drives was furnished by General Electric Co., while the mills and auxiliaries were designed and built by Bethlehem Steel Co. engineers and in its shops.

The 54-in. blooming mill is driven by a 7000-hp. direct current reversing motor with a speed range of 40 to 80 r.p.m. The roughing and finishing mills have each two driving motors, one on the main mill and one on a supplementary stand. The main motors are of 7000 hp. with a speed range of 65 to 100 r.p.m. The supplementary motors are of 1500-hp. with a speed range of 65 to 225 r.p.m. Direct current for the motors is furnished by flywheel motor-generator sets totaling 10,000 hp.

Practically all of the sections and sizes have been rolled on the mill and its tonnage is gradually increasing, as the machinery and crew are working into schedule production.

At the spring meeting of the Eastern States Blast Furnace and Coke Oven Association on June 3, at the Longue Vue Country Club, Pittsburgh, J. R. Campbell, bituminous representative American Rheolaveur Corporation, will present a paper on "Coal Washing."

International Congress on Scientific Management

American engineers and industrialists are invited to attend the third international management conference to be held in Rome, Italy, Sept. 5, 6, 7 and 8, under the auspices of officials of the Italian Government, of the city of Rome, and Benito Mussolini. The convention will deal with the scientific organization of industrial production, agriculture and commerce, the public service and public utilities, and domestic economy. The papers will be available in English, Italian, French, German and Spanish, and may be discussed in any of these five languages. Those submitted by the Committee on American Participation are now in preparation, covering management problems in manufacturing, marketing, simplified commercial practice, office administration, government and municipal administration, railroad administration, agriculture, household management and education in the field of industrial engineering.

At the close of the congress there will be a tour of inspection to the industrial centers and engineering works in northern Italy, including industrial establishments at Milan and Turin, hydroelectric stations on the Swiss frontier, and visits to Genoa, Venice and Trieste. Details regarding the congress may be had from Dr. H. S. Person, secretary of the Committee on American Participation, room 611, 29 West Thirty-ninth Street, New York.

Meeting of Iron and Steel Electrical Engineers

The program for the twenty-third annual convention and iron and steel exposition of the Association of Iron and Steel Electrical Engineers, to be held in Pittsburgh the entire week of June 13, has been issued. Technical sessions are to be held in the Pittsburgh Athletic Association Annex and the exposition in the Syria Mosque in the block next to the association clubhouse.

The program follows:

Monday, June 13, morning session, S. S. Wales, chairman. "Electrical Heating in the Iron and Steel Industry," by electrical heat committee, George H. Schaeffer, chairman. "Electrical Developments in the Iron and Steel Industry," by electrical development committee, W. H. Burr, chairman. Afternoon session, session of safety engineering division, C. L. Baker, chairman.

"Safe Practices in Connection with the Operation of High Tension Power," by A. N. Cartwright, general superintendent power division, West Penn Power Co., Pittsburgh; George E. Gramm, electrical engineer, H. C. Frick Coke Co., Scottdale, Pa., and Thomas E. Hughes, general foreman Carnegie Steel Co., Duquesne, Pa. Discussion by safety division and electrical engineers and superintendents of iron and steel plants, central stations and mines. Evening: Official opening of iron and steel exposition, and informal reception and dance for members and guests.

Tuesday, June 14, morning session only, B. R. Shover, chairman.

Symposium: "Anti-Friction Bearings for Heavy Duty Steel Mill Applications with Particular Reference to Roll Necks," by F. W. Cramer, assistant electrical superintendent, Bethlehem Steel Co., Johnstown, Pa.; C. J. Klein, engineering department, United Engineering & Foundry Co., Pittsburgh; F. H. Buhlman, engineering department, Rollway Bearing Co., Syracuse; E. C. Gainsborg, engineering department, SKF Industries, Inc., New York, and Fred Waldorf, engineer, The Timken Roller Bearing Co., Canton, Ohio.

"The Application of Synchronous Motors in Steel Mills," by Harry A. Winne, industrial engineering department, General Electric Co., Schenectady, N. Y.

Wednesday, June 15, morning session only, W. J. Harper, chairman. Session of combustion engineering division.

"Recent Boiler Plant Installation at Edgar Thomson Works, Carnegie Steel Co., Braddock, Pa.," by R. D. Abbiss, special engineer, Carnegie Steel Co., Braddock, Pa.

"The Flat Suspended Open-Hearth Roof," by A. L. Foell, chief engineer, Donner Steel Co., Buffalo. Evening: A. G. Place, chairman. Annual dinner dance for members and guests at Ball Room, Schenley Hotel.

Thursday morning, June 16, "Electrical Installations at New Structural Mills, Homestead Steel Works, Carnegie Steel Co., Munhall, Pa.," by C. A. Menk, electrical superintendent, Carnegie Steel Co., Munhall, Pa. Afternoon: Inspection trip to new structural mills, Homestead Steel Works of Carnegie Steel Co., Munhall, Pa.

Friday morning, June 17, A. J. Standing, chairman, "Fifteen Years of Steel Mill Illumination—What Change?" by Ward Harrison, director illuminating engineering division, National Lamp Works of General Electric Co., Cleveland. Afternoon: golf tournament.

Saturday, June 18, maintenance employees' day at Iron and Steel Exposition.

Steel Treaters' Exposition Promises to Be Largest on Record

The National Steel and Machine Tool Exposition to be held in Detroit the week of Sept. 19, under the auspices of the American Society for Steel Treating, demonstrates at this early date that it will be the largest of any of the eight previous shows.

The Chicago show last year marked a high water point. But more space will be available for exhibit purposes at Detroit than ever before, and present indications point to an exposition that will surpass, in size as well as other features, the 1926 show.

Over 80,000 sq. ft. have been reserved to date by 262 exhibitors, compared with 84,000, the total exhibit space used last year. There are approximately 39 spaces unreserved and these undoubtedly will be exhausted within the next 30 days. The total available space for exhibit purposes at Detroit approximates 90,000 sq. ft.

The Detroit show will be the best balanced factory equipment exposition of any previously held. It will contain all of the complete lines previously exhibited, in a proportion so that no particular line of equipment predominates, covering everything from steel, raw material, heat treating equipment, small tools, machine tools, forging equipment, inspection, handling and welding materials.

Approximately 10,000 sq. ft. will be devoted to an exhibit of welding material and equipment. This is a new feature of the steel and machine tool exposition, a certain portion of convention hall being set aside for this line of equipment. The welding part of the exhibit was previously carried on as an independent exposition under the auspices of the American Welding Society, which association will this year hold its annual fall meeting at Detroit the same week of the exposition and, in place of having an individual exhibition, will have it combined with the National Steel and Machine Tool Exposition.

From every angle the Detroit exposition gives promise of attracting to it the largest number of visitors ever in attendance at a steel treaters' exposition.

Steel-Treating Class Demonstrates Work

Modern methods in the study and treatment of steel were demonstrated at the third annual exhibit given by the cooperative evening class in heat treatment and metallography of steel, conducted under the auspices of the Philadelphia chapter, American Society for Steel Treating, at Temple University, on May 19 and 20. There was a large attendance of technical and practical men from local industries.

In point of equipment, the metallurgical laboratory now ranks among the best in the country. More than 200 students have attended this course, the present year's enrollment having been 55, with 10 in the advance class. An alumni association, including students of the past six years, was founded at a recent meeting.

Cooperative research with Philadelphia industries in the solution of metallurgical problems, involving annual losses of many thousands of dollars, was a special feature of the season's work. New equipment to be added to the laboratory next fall includes an Ajax-Northrup high-frequency induction furnace, and probably a small arc steel melting furnace, which will broaden the facilities for research.

As a part of the course, the class recently made a tour of inspection through the Midvale Steel Works, and also visited the heat-treating department of the Wiedemann Machine Co.

Riveting and Welding to Be Discussed at Meeting of Boiler Inspectors

Of the six formal addresses planned for the fifth annual meeting of the National Board of Boiler and Pressure Vessel Inspectors, two will deal with welding and one with riveting. The convention will be held at the Hotel Hermitage, Nashville, Tenn., June 14, 15 and 16.

The first session will be devoted to the presentation and discussion of the reports of officers and of the various committees of the Board. The following three addresses are planned for the afternoon session, June 14: "The Behavior of Materials Used in Boiler Construction When Subjected to Service Conditions" by S. B. Applebaum, assistant technical manager, Permutit Co., New York; "Corrosion, Its Cause and Prevention," by C. R. Texter, metallurgical department, National Tube Co., Pittsburgh; and "Destructive Effects of Free Oxygen in Steam Due to Its Decomposition During Superheating," by E. A. Goehegan, Foremost Superheater Co., New York.

At the morning session, June 15, S. W. Miller, Union Carbide & Carbon Research Laboratories, Inc., Long Island City, N. Y., will speak on "Fusion-Welding on Boilers and Pressure Vessels." The second paper relating to welding is that of T. McLean Jasper, director of research of the A. O. Smith Corporation, Milwaukee, on "The Application of Electric Arc Welding to Heavy Vessel Construction." Riveting will be discussed by A. F. Jensen, president of the Hanna Engineering Works, Chicago, the subject of whose address is, "The Dependability of the Riveting Art." Mr. Jensen's paper will be illustrated by motion pictures.

An informal dinner for members and guests is planned for the evening of June 14. The secretary of the National Board is C. O. Myers, chief boiler inspector of the State of Ohio.

Six American Engineers Honored

For eminent service to the Czechoslovak State, six American engineers have received the Cross of Knight of the Czechoslovak Order of the White Lion. They are: Prof. Joseph W. Roe, head of the Department of Industrial Engineering in New York University; Calvin W. Rice, secretary American Society of Mechanical Engineers, New York; Alfred D. Flinn, director Engineering Foundation, New York; Lawrence W. Wallace, executive secretary American Engineering Council, Washington; H. S. Person, managing director Taylor Society, New York; Morris L. Cooke, industrial engineer, Philadelphia.

The order was created "in accordance with the approval of the President of the Republic, as decoration for citizens of foreign States in appreciation of their services rendered on behalf of the Czechoslovak State."

Further Plans Made for International Congress for Testing Materials

Announcement of the holding of an international congress for testing materials, Sept. 12 to 17, at Amsterdam, Holland, was made and some brief details were published in THE IRON AGE of March 24, page 852. Since then, says the *Bulletin* of the society, a special committee consisting of T. D. Lynch, chairman; P. H. Bates; T. G. Delbridge; Zay Jeffries and G. W. Thompson, has been appointed to make arrangements for American participation in the congress.

Offers of 24 papers from members of the society have been secured by this committee, the topics bearing on those subjects which have been announced for discussion at the congress. These offers have been transmitted to the Dutch committee in charge of the congress. Of these papers, three are of a general nature. Eleven relate specifically to the field of metals, including such topics as metallography, fatigue of metals, properties at high temperatures and magnetic testing; four to cement and concrete; and six to miscellaneous material. The subjects covered are all of considerable importance in this country as well as internationally. Several of the authors have expressed their intention of attending the congress and presenting their papers in person. Further details, including a complete program, are expected from abroad in the near future.

Says Accident Reduction Is Greatest Among Self-Insuring Companies

PATERSON, N. J., May 31.—The effect of the workmen's compensation laws upon accident prevention was electrical, according to a statement by Ethelbert Stewart, United States Commissioner of Labor Statistics, in an address here before the fourteenth annual convention of the Association of Governmental Labor Officials of the United States and Canada. These laws, it was asserted, made an accident cost the industry and the employer money regardless of who was to blame. The smaller employers, being unable to carry this risk, insured themselves in accident and liability companies. These companies, at least the larger ones, Mr. Stewart declared, undertook to fix standards of safety appliances and equipment, which companies carrying insurance were required to observe. A material reduction in accidents has been effected, he stated, judged by the reports of accidents in the few States which had reports of accidents prior to the enactment of compensation legislation.

Mr. Stewart said, however, that there is a later development which is not so apparent in reducing the number of accidents. Because of high insurance premiums, he pointed out, the larger corporations decided to carry their own risk and accidents among employees of those companies have rapidly decreased, but he declared that among the smaller companies, not big enough to become self-insurers, and the greatest employers of women and young persons, the rate of accidents is increasing. A thing which tends to increase hazard, Mr. Stewart said, especially for young persons, is the tendency to push production to the highest possible point by means of improved machinery, mechanical appliances, conveyors, power hoists, and trucks, and by speeding up workers. The child, the youth under 20, it was asserted, has not the same muscular control and the same coordination of body and mind found in mature persons. He charged also that smaller companies have adopted the attitude of letting the insurance companies "do the worrying."

Engineering Meeting in Seattle in August

Engineering problems of the industries on the Pacific Coast will be discussed at the Seattle regional meeting of the American Society of Mechanical Engineers to be held Aug. 29-31. The subjects to be discussed include the petroleum industry, harbor machinery, Diesel-engine development, metal mining machinery and hydraulic machinery. The committee appointed to conduct the meeting consists of E. O. Eastwood, chairman, professor of mechanical engineering, University of Washington; Ira Dye, industrial engineer; Lyle Dudley, Western Blower Co.; R. W. Rockwell, consulting engineer; C. W. Tubby; John Moran, Moran Mfg. Co.; Philip Johnson, Boeing Airplane Co.; G. S. Schaller and R. W. Raport; all of Seattle.

To Exhibit Roll Neck Roller Bearings

A steel mill roll neck bearing will be one of the features of the exhibition of the Timken Roller Bearing Co., Canton, Ohio, at the Iron and Steel Exposition at Pittsburgh, June 13-18. This is the type of bearing which has been applied to both cold roll and structural mills. The bearings have been made in capacities up to 2,000,000 lb. radial load, at 100 r.p.m., and for various sizes of roll necks. The dimensions of the bearing that will be exhibited are 17 in. bore and 27 in. outside diameter. Several bearings of this type have been installed and are now operating in some of the largest mills of the country. A paper covering the results of tests made on the bearings will be presented by F. Waldorf, of the Timken company.

Metric Campaign Based on Illegality

The "Mendenhall Order" of 1893 Aimed at Nullifying the Acts of Congress Which Established the English System of Weights and Measures

SAMUEL S. DALE, Boston, has done a vast amount of good work in throwing the light of facts upon the attempt to compel the use of the metric system in the United States. As one campaign of attack upon this country's legal standards has followed another, Mr. Dale has been a foremost figure in the defense of the English-American system. His latest contribution is a statement laid before the Senate Committee on Commerce in December last in the hearing at Washington on the bill to empower the Bureau of Standards to extend the use of the metric system in the United States.

It was expected that this statement would be printed in the record of the Senate committee's proceedings, but the committee decided not to print any of the testimony presented at these hearings. However, a private printing of Mr. Dale's argument makes available a document that throws a flood of light on the methods employed for many years in the pro-metric campaign in the United States. The statement makes a 24-page pamphlet and is given the title "The Mendenhall Conspiracy to Discredit English Weights and Measures."

In the syllabus on the cover of this pamphlet, Mr. Dale charges that "since 1893 Government officials, scientists and others engaged in metric propaganda in the United States and Europe have made the Mendenhall order the basis of a conspiracy to discredit the English system in their efforts to make the United States a metric country."

Exception may be taken to Mr. Dale's charge that a conspiracy was involved in the Mendenhall order of 1893 and the use metric advocates have made of it in the past 34 years. The argument would have been just as strong had the author simply presented the facts and left out the word "conspiracy," since the basis for its use is inference rather than evidence. But there is no escaping the conclusion that the Mendenhall order was illegal, a usurpation of the authority which the constitution lodged in Congress, and in Congress alone, to "fix the standard of weights and measures" and consequently is of no effect. Nor is there any escape on the part of certain Washington officials, of responsibility for the policy they have followed in recent years, of putting the Mendenhall order above the Acts of Congress, in the recognition they have given to the meter as standard, rather than the English yard.

Genesis of the Mendenhall Order

T. C. Mendenhall was superintendent of weights and measures in the United States Coast and Geodetic Survey when he issued the order of 1893. He was an active advocate of the metric system, and had made plain his opposition to the British standards which Congress had established as standard for the United States. The opportunity for his stroke in behalf of metric standards was afforded by the Act of Congress of July 28, 1866, defining in terms of the fundamental British system the 28 units of the metric system and making it lawful to employ the weights and measures of the metric system throughout the United States. Of this Mr. Dale says:

> The meter was defined [in the law of 1866] as equivalent to 39.37 inches; the kilogram as 2.2046 pounds. The precise equivalent of the meter in terms of the English system has been determined at the International Bureau of Weights and Measures, near Paris, by the joint labors of H. J. Chaney, Warden of the Standards of Great Britain, and J. Rene Benoit, Director of the International Bureau, as 39.370113 inches, so that the effect of the Act of Congress of 1866 was to legalize a meter slightly shorter than the meter of France for the construction of contracts and all legal proceedings.

Legal Standard Overturned

The Mendenhall order of April 5, 1893, was issued soon after Superintendent Mendenhall had sent a curt refusal to a suggestion from the Warden of British Standards that the United States Government and the British Government "cooperate in having the material standards of the yard at London and at Washington compared with the new material standards of the meter, in order that the relation between the yard and the new meter might be determined by the best scientific and technical methods." Mr. Dale continues:

> Three months after refusing to cooperate with the British Government, Superintendent Mendenhall issued his order of April 5, 1893, to clinch if possible the plan to exploit the metric system as the fundamental standard of the United States and cast into the discard the English standards which nearly 300 years of continuous use by the people, the decisions of the courts, the acts and resolutions of Congress and the practice of executive officials had made the legal and actual standards of the United States. This order stated that the two material standards of the new meter and kilogram received in 1889, "should henceforth be considered the fundamental standards of the United States *from which the yard and pound would be derived!*"

Making Two Yards Instead of Two Meters

That the Mendenhall order was a palpable misuse of authority which opened the door for the misleading claims that have long been promoted by pro-metric advocates, Mr. Dale brings out effectively in the following:

> Along came Superintendent of Weights and Measures Mendenhall, who, bent on doing all he could to make the metric system the single standard of the world, objected to a meter in the United States shorter than the meter in France. To get around this situation he advanced the claim that, while the law of 1866 stated that a United States meter is 3937/3600ths of a yard, it really meant that the yard in the United States is 3600/3937ths of a French meter, and that, as the yard in Great Britain is 3600/3937.0113ths of a French meter, the yard in the United States is longer than the yard in Great Britain, while the meter is the same in all three countries. By turning the law upside down in that way, juggling the fraction to make the numerator of the law the denominator of his metric fiction, and substituting the French meter for the yard recognized as basic by the Act of 1866, Superintendent Mendenhall arrived at the conclusion having no basis in law or in fact, that the yard in the United States differs from the yard in Great Britain.
>
> What would this fictitious difference have amounted to if it had been created by Act of Congress? About one-sixth of an inch to a mile. Invisible on an inch, a foot or a yard, as the representative of the Metric Association was forced to admit under cross-examination by the Senate Committee on Commerce on Dec. 10, 1926, its ultramicroscopical dimension on an inch would have to be repeated 63,360 times in order to amount to one-sixth of an inch at the end of a mile. * * *
>
> Nowhere have the metric protagonists told the truth about the yard standard of the United States. Invariably the fiction has been spread in a form to create the belief that the United States has abandoned English weights and measures and adopted the metric.

Would Uproot Mendenhall Fiction

Mr. Dale's statement strongly protests against the McKinley and Gillett resolutions, introduced in Congress last year, which proposed to refer the metric question to the Bureau of Standards. He holds that this would amount to handing the English system over to its enemies. Instead he urges that the Mendenhall fiction of 1893 be rooted out of the bureaucratic practice and vocabulary of the United States Government, and

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CONTENTS

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Solving a Foundry's Problems

OUR leading article this week is the first of a series covering mechanical phases of foundry operation. It represents the results of technical study of the particular conditions as well as the general situation to be met, and we believe it will prove to be an unusual contribution. Insofar as materials handling is covered in these articles, the information will serve well by way of suggestion of applications for most manufacturing processes. The handling of materials is becoming more and more a prime factor in plant management.

This Issue in Brief

Two lifting magnets on single traveling crane save time and money. Magnets are operated independently by one craneman. They unload **a car of pig iron** in close to **half the time one** magnet would take.—Page 1588.

Advocates definite "one-price" legislation. While manufacturers maintain fairly uniform prices, competitive conditions among distributers result in demoralized resale prices, declares steel merchant. The Sherman law gives manufacturers the right to stipulate resale prices, but there is no law penalizing the distributer who cuts prices.—Page 1597.

Would the five-day week increase purchasing power? The economics involved in the theory of "more leisure, more buying power" is too complicated to permit general agreement among economists. If the shortened week could be had with no greater labor cost, it would be a distinct gain to industry; otherwise, a positive harm to the country's prosperity.—Page 1599.

Production efficiency averages less than 50 per cent, says Dean Kimball. However, engineers working to overcome this handicap are questioning some of the conclusions of theoretical economists which have long stood unchallenged.—Page 1600.

Manufacturers will not be forced to divulge intimate cost data. Federal Trade Commission drops the famous Claire Furnace case, giving "lapse of appropriation" as the reason.—Page 1600.

Red light on bulletin board means that someone is out because of an accident. A green light is flashed as soon as the injured man returns. Thus malingering is subtly discouraged.—Page 1607.

Rail failures in Europe averaged about the same as ours, approximately one for every two miles of track, during 1926. And, as in the United States, about two-thirds of the failures were of the head type.—Page 1613.

Japan may soon resume imports of black sheets. The largest producing plant may close down because of financial difficulties.—Page 1613.

Profitless small orders cannot be avoided, says steel and heavy hardware merchant. Price differential would drive business to merchants not charging the extra. Furthermore, many of the small-lot orders come from customers who often buy good-sized lots.—Page 1598.

Railroads expect substantial savings to result from adoption of standard scrap specifications. Uniform classification has been adopted generally. Standardization has sharply reduced many items of material and stock. One road has cut its items purchased from 150,000 to 63,300.—Page 1598.

Melts 14½ lb. of iron consistently per pound of coke.—Maytag accomplishes this by a careful control of temperature, volume and pressure.—Page 1589.

While world output of electric steel declines, United States' production increases. Only three other of the ten leading countries showed a gain in 1925 over 1918. Domestic output was 20 times the 1913 tonnage.—Page 1591.

Foreign producers favored by short ore haul, but none has such a low fuel cost as Pittsburgh, per ton of iron. High fuel cost is forcing Britain to the use of higher grade, imported ores.—Page 1594.

Accident rate decreasing among large employers, and increasing among small employers, says Government official. Declares that self-insurance, induced by high insurance premiums, has encouraged the adoption of safety measures and appliances. Small concerns, he says, are inclined to let the insurance companies "do the worrying."—Page 1616.

Your export business will not increase gratuitously, but intelligent effort will result in growth, says James A. Farrell. While Europe is selling less to us and buying less from us than it did during the five-year prewar period, our trade with other continents, notably Asia, has increased greatly—Page 1601.

Charge for delivering small lots, jobber suggests. One firm charges $2 a ton on steel bars, with a minimum cartage charge of 50c. However, competitors must cooperate if this leak in handling small orders is to be plugged.—Page 1597.

Exports of iron and steel rise, while imports fall. April shipments totaled 192,239 tons, a gain of 11 per cent over preceding month. Imports amounted to only 60,374 tons, the second lowest month since November, 1924.—Page 1610.

Charges interest on past-due accounts, and collects 95 per cent of them. Success in charging slow-paying customers for the use of credit is reported by steel and hardware merchant.—Page 1597.

Pig iron production in May falls off 4⅕ per cent. Total output estimated at 3,387,370, gross tons, or 109,270 tons a day, compared with a daily average of 114,074 tons in April, this year, and with 112,304 tons in May of last year. Twelve furnaces, of which ten were steel company stacks, were blown out and three were blown in, a net loss of nine.

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Standardizing the Union Worker

ONE of the prime causes of opposition to organized labor in the past has been its insistence on equal pay for all members of a given trade irrespective of their ability or output. Employers have felt, and rightly, that this automatically tended to limit the output of their more highly skilled employees. It is not in human nature for one man to work harder than the man next to him, for the same remuneration.

A few years ago the suggestion was made that opposition to organized labor on this score would be largely removed if the unions would voluntarily grade their members on the basis of their ability. Thus possession of a union card would not serve automatically to give the poor worker the right to demand in a union shop the same wages as the most highly skil'ed worker in the same trade. His card would show his grade, and he would be entitled only to the scale of wages of that grade until he had demonstrated his ability to earn the pay of a higher grade.

This plan might be called impractical, were it not that it has been tried and proved sound in at least one instance. In a large mid-Western shop, an open shop but manned 100 per cent by union workers, the management, with the consent of the union, divided its employees into four grades. All men newly hired started work in the lowest grade. Their promotion depended upon their attaining the minimum output fixed for each grade. Incidentally, this particular shop never had any labor trouble, although there were several general strikes in its vicinity, and its record for productive efficiency has seldom if ever been equalled in this country.

With a growing acceptance by organized labor of the setting of standards of output by means of time study, it should not be a long step for the unions to arrive at various standards in each trade, which would be an index of the ability of the worker.

If organized labor would voluntarily take such a step, and would honestly grade its members according to such standards, it would in all probability find that considerable of the opposition it now encounters would disappear.

Heavy Capital Charge in Steel

RELATIVE to the degree of competition, steel prices have been much steadier in the past three years than would have been the case in the early years of steel manufacture in the United States. There has been more price cutting than there should have been, but the competition has been very strenuous indeed. It is commonly remarked that the sellers have a different viewpoint today, which is strictly true, but all the reasons for the difference in viewpoint are not always brought out. The new spirit of cooperation is stressed, and quite properly, but the great increase in capital charges is also an important influence.

In the production of steel the man power has decreased greatly, while the capital power is much increased. Going back only 24 years for comparison a striking difference is seen in statistics of the United States Steel Corporation. In 1902 the steel products, in the form in which they were made for sale, ran 59 tons per man employed in iron ore mining and in manufacturing. In 1926 the figure was 73 tons, an increase of 24 per cent. Men employed in coal, coke and transportation are not included in the computation.

The actual increase is considerably greater than the above figures show, since the corporation has increased the average degree of finish of its products and substituted three shifts for two in various operations. In iron mining alone there was a slight decrease in the number of men employed, from 1902 to 1926, whereas the production increased 81 per cent.

The labor cost of making a ton of finished steel does not reflect the decrease in the number of men required, because wages have so greatly increased. Costs have run to heights inconceivable in the eighteen-nineties, when so many steel plants were being built. It may be true of many industries that greater capital expenditures so increase output as to make little change in the cost per unit, or even effect a decrease, but it has been far otherwise with steel. The cost of doing a given thing has greatly increased from 30 years ago, when all prices were at a low point; but the

size of the thing to be done has greatly increased. The blast furnace or steel plant of today, built at 1897 levels, would have been very much more costly than the plants of those days.

A striking illustration is furnished in tin plate, the manufacture of which requires a particularly large number of men per ton of output. Plants built in 1896-7-8 cost about $25,000, complete, per hot mill. The latest cost of the bare equipment is about $400,000 per mill, 16 times as much. Output per mill has approximately doubled, increasing, say, from 40,000 to 80,000 boxes per annum, allowing for some idleness. The capital outlay per unit is thus multiplied by eight. Neither the cost of repairs nor the allowance for depreciation, in percentage of original outlay, can be taken as having decreased. It will readily be seen how heavy a charge there is per box of tin plate for use of capital, for repairs and for depreciation.

Blast furnace costs varied 30 years ago and they vary now; but a rough approximation shows that despite the great increase in output per stack the capital charges per ton of pig iron have increased enormously. And so it is all along the line. The necessity of striving to maintain prices has accordingly greatly increased. There is correspondingly stronger resistance to the temptation to cut prices to secure a larger output. The contribution to overhead of every ton made must be guarded, for otherwise many tons, or all, might slip through without making their necessary contribution.

Non-Ferrous Metals at 1913 Levels

METALS have made a considerable contribution to the downward movement of the "index number," representing average prices for commodities, which for more than a year has been so much a subject of comment in business reviews. The monthly compilation of the United States Bureau of Labor Statistics shows that while the April average for all commodities was 144.2, on the basis of 100 for 1913, "meta's and metal products" stood at 121.9. The iron and steel average for the month was 131.7, while the average for non-ferrous metals was 100.2. Seeing that there were further declines in the non-ferrous list last month, those metals and their products are now alone, among the nine major commodity groups for which the statistics are compiled, in selling at less than the average prices of 1913.

Lead, zinc and copper have all shown recent declines which carry them to the lowest or close to the lowest point touched in three to four years. Lead at 6.10 cents per pound, St. Louis, is now selling at the lowest price since July 24, 1923. The high point in the period was reached in January, 1925, at 10.35 cents, St. Louis. Zinc lately has fallen to similar depths. Last week it sold at 6 cents, St. Louis, or lower than in any week since Aug. 2, 1924. Meanwhile the peak price has been 8.90 cents, St. Louis, which was reached in November of the 1925 movement. The ups and downs of copper are familiar history. As with lead and zinc, a producing capacity steadily in excess of demand has kept prices at low levels. Electrolytic copper, selling now at 12.37½ cents, refinery, and in the past week at 12.25 cents, is close to the lowest level in many months.

In steel, with 70 per cent of production in the hands of five or six companies, and with consumers more than ever limiting purchases to requirements, there has been a fair measure of adjustment of output to current consumption. The copper industry, on the other hand, has often shown that it is able only to pile up stocks in the face of inadequate demand. But consumption, along with production of copper, as well as lead and zinc, has been making new records since 1924. Hence the present unenviable distinction of the non-ferrous group in dropping below the price average for 1913 is prompting some skepticism as to the continuance of demand on the scale of the past twelve months.

Progress From Many Factors

NEW appliances and new methods are often hailed as detached phenomena when they are the product of many influences. We do not usually give enough credit to the numerous contributions that are made to a given success. Dr. Langley's researches in aerodynamics, the designing skill of the Wright brothers, progress in internal combustion engines, and the acquired skill of aviators all contributed largely to the airplane's development. For driving his "whirling table" Dr. Langley discarded a gas engine of the day, some 40 years ago, and employed instead a steam harvester engine. Lilienthal met his death in 1889 after some successful "glides" measured in minutes. Of late, aviators have glided for hours at a stretch.

Remark is often made that the electrical industry has contributed enormously to the steel mill layout of today; but there is the other side, the great contributions the steel industry has made to the electrical industry in developing steel adapted to the various electrical uses. Chemistry has done much for steel, and steel has done much for the chemical industries.

In the broader sense, developments induced by one industry are applied to other industries. When the Panama Canal was being dug, much publicity was given to the quantities of earth moved per steam shovel per day. In the Lake Superior ore region steam shovels were already handling larger quantities of material. Steam shovels would not have been so efficient had not the iron ore industry called for many shovels for stripping and mining.

There was a Congressman who objected to the building of somewhat larger battleships from time to time. He insisted that the Navy Department should at once build the largest and best battleship possible. There were various things the Navy could not do, such as developing for the use of a battleship the best turbine that has since been made.

In the economic sense, still broader, we have cooperation of forces. The corporation has been developed, facilitating the aggregation of capital for a single large venture. Profits have been made and means furnished for investment in other corporations. Labor has specialized so that it can control more intricate machinery, and the machinery has contributed to the education of labor. Large corporations have been able to do research work and the work has benefited society as a whole.

In all these things there must be *pari passu*

progress. Industries must not be developed before there are railroads to serve them properly. Railroads must not be built until there are industries to furnish them traffic. Automobiles need good roads, but good roads need automobiles to make them worth while. An industry may fail by spending too much money in research work aiming at a product the public is not ready to absorb in sufficient quantities. Again, an industry may be held back because a material it needs is not ready for it. We make our best progress when all these things run at their proper paces one with another.

NOT only in tinplate and black sheets, but in steel rails, some good records have been made in our exports this year. For the first quarter the monthly shipments of rails to foreign consumers averaged 18,700 gross tons, the largest in a number of years, though still well below the 37,700 tons per month shipped abroad in 1913. In 1926 these exports were 15,600 tons a month, and in 1925 they averaged 12,600 tons. The larger movement this year is due in part to increased demand from Japan and more particularly from Brazil. The fact that Great Britain exported only 13,600 tons of rails per month in the first quarter of 1927, as against 24,700 tons per month to April 1, 1926, suggests that some of the increase in American exports is due to contracts closed when British mills were still beset by the uncertainties of the coal strike.

SECRETARY HOOVER'S smoothing out effort of six years ago, when unemployment was great, has taken effect in the building industry, as is shown in figures compiled by the Department of Commerce. While these relate only to the years 1922 and 1924, they show that the first quarter recorded a substantial gain in its proportion of the year's total, in both employment of building labor and purchases of building materials. In the case of building labor, employment advanced from 14 per cent of the year's total in the first three months of 1922 to 20.5 per cent in the like period of 1924. Similarly with regard to building materials, the record of the first three months of 1922 was 14.6 per cent of the twelve-month total, and this increased to 17.6 per cent in 1924. Obviously, by the amount to which activity in the slack season was increased, that in the customarily heavy season was reduced. Thus the peaks of the seasonal curve were measurably flattened out.

WHILE April showed the lowest import movement of iron and steel, with the exception of February, in 30 months, and the ten months ended April 30 showed a decrease of 14 per cent from the corresponding period of last year, the declines were in special products and were not general. As a matter of fact, there was an increase of 54 per cent in incoming tonnage of rolled and finished material in the ten months, compared with the preceding year, this total having gone up from 218,000 tons to 336,000 tons. The net decrease in the aggregate imports is accounted for by a drop of 63 per cent in imports of pig iron, or from 428,000 tons to 158,000 tons. Not only did rolled and finished imports increase heavily but the incoming tonnage of cast iron pipe almost doubled, advancing from 48,000 tons to 88,000 tons. Thus our steel rolling mills and pipe foundries are feeling increased competition from abroad, while our eastern blast furnaces are having less. They are making up for the shrinkage in foreign iron coming in, however, by more intense competition among themselves.

Pittsburgh District Gets Lower Rate on Coal to Lake Ports

PITTSBURGH, May 31.—The Pittsburgh coal trade derives gratification from the recognition by the Interstate Commerce Commission of the principle that the district is entitled to a greater freight rate differential over the Southern producing district on coal moving to the Lakes, but it does not expect immediate benefit from the reduction of 20c. per ton which the commission has ordered to become effective Aug. 10.

The reduction places the Pittsburgh field practically on a parity with southern West Virginia and Kentucky in delivered prices at lower Lake ports, since, assuming a price of $2 per net ton at mines in the Pittsburgh district for run-of-mine coal, which is as low as operators believe they can go on the present scale of wages, there will be a delivered price, at the new rate of $1.46 per ton, of $3.46 on contracts for delivery during the period of Lake navigation. The Southern coal, on the other hand, has been sold at $1.50, which with a rail freight charge of $1.91 means a delivered price at lower Lake Ports of $3.41.

It will be necessary for Pittsburgh district operators to cut the price at least the 5c. necessary to equalize with the Southern fields, and as it is generally understood that the Southern producers already have corralled contracts for approximately 75 per cent of this year's Northwestern requirements, it would seem that they would have to cut more to get a share of the remaining open business.

The question of wage scales stands out prominently in the picture of what is immediately ahead. Mine union leaders in Pittsburgh have interpreted the rate decision as enabling the former union mine operators to pay the Jacksonville scale, but it can be said authoritatively that nothing is further from their minds. On the Jacksonville scale, costs would make necessary a price of about $2.50 at mines for run-of-mine coal.

Pittsburgh district coal after Aug. 10 will move to the Lakes at 45c. a ton less than coal from the Southern fields, instead of 25c. as at present, and Pittsburgh will have a preferential over the northern West Virginia district of 25c. a ton as against 15c. now.

Cast Iron Tunnel Segments Awarded

The 16,600 tons of cast iron segments for the tunnel under the East River at East Fifty-seventh Street, New York, was divided by the general contractor, Patrick McGovern, Inc., between the Davies & Thomas Co., 342 Madison Avenue, New York, and the Wheeling Mold & Foundry Co., Wheeling, W. Va.

The Mason & Hanger Co., New York, successful bidder on the general contract for a tunnel and subway construction from Fulton Street, New York, under the East River to Brooklyn, does not expect to award the 54,000 tons of cast iron segments required for tunnel lining for several weeks.

Exports of agricultural implements from the United States in April of this year were valued at $8,049,041, a total considerably larger than average monthly shipments in 1926, according to the Agricultural Implements Division, Department of Commerce. The April total was, however, about $500,000 less than the value of similar exports in April, 1926, and about $700,000 below the figure for March of this year.

Sharp Loss in May Pig Iron Output

Estimates, Collected by Wire, Show Daily Rate 4804 Tons, or 4.2 Per Cent Less Than April—Net Loss of 9 Furnaces

DATA gathered by wire on May 31 show that the estimated pig iron production for May was 3,387,370 gross tons, or 109,270 tons per day. The figures represent estimates of output for the last two or three days of the month by the companies sending in the returns. It was necessary to estimate in this office the production of only five furnaces.

The May output of 109,270 tons per day compares with 114,074 tons per day in April—a loss of 4804 tons per day, or about 4.2 per cent. The next smallest production this year was February at 105,024 tons per day. A year ago the May output was 112,304 tons per day.

Net Loss of Nine Furnaces

There were 12 furnaces shut down and only three blown in, a net loss of nine. In April the net loss was three. Of the 12 furnaces shut down all but two were steel-making stacks, seven belonging to independent steel companies, three to the Steel Corporation and two to merchant iron producers. The three furnaces blown in included two independent steel company stacks and one merchant. On June 1 there were 211 furnaces active as compared with 220 on May 1. The total of possibly active furnaces has been reduced to 362.

Furnaces Blown In and Out

The following furnaces were blown in during May: The Norton furnace of the American Rolling Mill Co. in Kentucky; No. 5 Iroquois furnace of the Youngstown Sheet & Tube Co. in the Chicago district and the Rockdale furnace of the Roane Iron Co. in Tennessee.

Among the furnaces blown out or banked during May were No. 3 Swede furnace in the Schuylkill Valley; No. 3 Clairton furnace of the Carnegie Steel Co.; one Aliquippa furnace of the Jones & Laughlin Steel Corporation; No. 2 Midland furnace of the Pittsburgh Crucible Steel Co.; No. 1 Monessen furnace of the Pittsburgh Steel Co. and the Clinton furnace in the Pittsburgh district; D furnace at the Cambria plant of the Bethlehem Steel Corporation in Bethlehem, Pa.; the Oriskany furnace of the E. J. Lavino & Co. in Virginia; one Madeline furnace of the Inland Steel Co. in the Chicago district and the Alice and Oxmoor furnaces of the Tennessee Coal, Iron & Railroad Co. in Alabama.

Production by Districts

The estimated May production by districts is given in the table. The actual output for May will be published in THE IRON AGE, June 9.

Pig Iron Production by Districts, Gross Tons

	May (31 days)	April (30 days)	March (31 days)	Feb. (28 days)
New York and Mass.	226,571	224,933	232,561	198,877
Lehigh Valley	86,531	88,409	97,046	83,712
Schuylkill Valley	74,710	79,693	86,357	75,063
Lower Susq. and Lebanon Valleys.	41,429	47,828	52,922	42,753
Pittsburgh district	679,557	713,181	725,418	604,415
Shenango Valley	123,304	127,760	127,295	100,142
Western Penna.	117,350	131,359	126,905	102,912
Maryland, Virginia and Kentucky	109,244	96,880	99,366	90,620
Wheeling district	150,131	152,155	136,116	113,632
Mahoning Valley	274,414	280,266	301,941	265,389
Central and Northern Ohio	346,115	333,866	353,977	303,080
Southern Ohio	43,997	44,762	47,567	42,189
Illinois and Indiana	703,384	690,308	661,496	534,605
Mich., Minn., Mo., Wis., Colo. and Utah	147,504	149,656	156,405	140,730
Alabama	250,966	251,401	271,097	236,786
Tennessee	12,163	9,769	6,893	5,774
Total	3,387,370	3,422,226	3,483,362	2,940,679

Increase in River Shipments of Iron and Steel

A slump in the movement of coal cut steeply into the April commerce of the Allegheny, Monongahela and Ohio Rivers within the district of the United States Engineers at Pittsburgh. There were substantial increases in the movement of all other commodities, particularly in coke, sand and gravel, while the shipments of iron and steel at 84,711 tons were 18,983 tons more than in March. The loss in coal shipments, however, was 1,032,418 tons and the month's aggregate shipments were the smallest since January. The sharp decline in the coal item probably finds explanation in the fact that shipments were abnormal in February and March, in the effort of industrial consumers located on or near the rivers to accumulate a stock against the possibility that a shortage might grow out of the strike of the union soft coal miners on April 1.

Details of the April commerce of the rivers, based upon estimates furnished the United States Engineers, Pittsburgh office, by lock-keepers, with figures in net tons, follow:

Commodity	Allegheny River	Monongahela River	Ohio River	Total
Coal	32,165	1,507,426	316,480	1,856,071
Coke	15,400	74,667	23,800	113,867
Gravel	67,225	97,900	146,138	311,263
Packet cargo	.....	.....	4,640	4,640
Sand	65,245	90,900	192,552	348,697
Iron and steel	150	37,811	46,750	84,711
Unclassified	3,830	20,927	14,040	38,797
Total for April	184,015	1,829,631	744,400	2,758,046
Total for March	108,433	2,529,828	765,632	3,403,893
Total for February	85,605	2,117,558	624,697	2,827,860
Total for January	89,242	1,935,879	621,496	2,646,617

Sheet Wage Scale Agreed on for Another Year

YOUNGSTOWN, May 31.—Sheet manufacturers, acting through the Western Sheet and Tin Plate Manufacturers Association, have agreed with employees on a wage scale and working conditions for another year. At the annual conference in Atlantic City the settlement was made on last year's rates, with slight changes in the footnotes.

Current Coal and Coke Production

Bituminous coal produced in the week ended May 7 is reported by the United States Bureau of Mines at 8,182,000 net tons. This compares with 8,424,000 tons in the preceding week and with 7,937,000 tons in the week before that. The three weeks showed 24,543,000 tons, compared with 27,435,000 tons in the corresponding three weeks of 1926, when there was no strike.

By-product coke produced in April, excluding screenings and braize, is reported by the Bureau of Mines at 3,707,000 net tons. This is a slight decrease from the March figure of 3,879,000 tons, but is otherwise the best month of the year. It compares with an average of 3,712,000 tons for the 12 months of 1926 and with much smaller amounts in preceding years.

Beehive coke produced in April amounted to 780,000 net tons, compared with 890,000 tons in March. While April output was greater than that in February, it otherwise was the smallest so far this year. It compares with an average of 957,000 tons per month in 1926 and 946,000 tons in 1925.

Iron and Steel Markets

Consumption Still Well Sustained

Apart from Rails and Tin Plate, Demand Shows Only Slight Shrinkage—Buyers Appear to Take Higher Prices Seriously—May Pig Iron Output

PIG iron output in May, with the last few days estimated, shows a drop in the daily average of about 4¼ per cent from April. It was 3,387,370 gross tons, or 109,180 tons a day, and compares with 3,422,226 tons for April (114,074 tons a day) and 3,481,428 tons for May, 1926. The falling off in May last year from April, 1926, was 2¼ per cent. The indicated production so far this year is within 275,000 tons of being equal to the 16,613,000 tons made in the five months of 1926.

On June 1 there were 211 furnaces in blast, of the now available total of 362, a net loss of nine furnaces in the month. Three Steel Corporation stacks went on the idle list, seven independent steel company stacks and two merchant furnaces, while the three put into operation belonged to one merchant iron maker and two independent companies. On June 1, 1926, there were 228 furnaces active.

In steel, reports point to a surprising maintenance of general consumption. Although the tendency is downward, the shrinkage is in volume rather than in number of orders and serves to emphasize the concentration on keeping minimum inventories. Backlogs of unfilled tonnage have increased as much as 10 per cent with companies not rolling rails, now between buying periods, or making tin plate, which does not promise so well as in the first half of the year. Again, with other mills, shipments have exceeded bookings by 25 per cent.

Ingot production has receded somewhat in the South, but otherwise changes are of small proportions. The expectation now is that in view of the high output in May, sustained largely by releases on March contracting, the first half will match more closely than seemed likely the record breaking output of the corresponding period last year.

The efforts mills are making to establish higher prices on shipments after July 1, as on sheets and strips, are taken seriously, judging from the full specifying now generally evident on existing lower price orders. Fresh sales for immediate needs have put black and galvanized sheets at 3c. and 3.85c., Pittsburgh, an advance of $2 a ton, or to the level sought by makers. For autobody sheets, 4.25c. is still an asking price, the body builders not yet needing to make new purchases.

In tin plate, on one attractive order, the lowest price was $5.40 per base box, Pittsburgh, a concession of only 10c. a box, whereas several weeks ago the base quotation was shaded by 25c. and on one order of only moderate size the price went close to $5.

Irregularity in wire nails is still pronounced, with competition of varying intensity in different localities. Production is pointing downward, although a more active demand is developing for fencing and barbed wire and staples from flood-damaged regions.

The semi-finished steel market is generally quiet, which accounts in part for quotations of wire rods in the East at $40 and $41.

On active bidding for plate orders, prices have softened so that 1.80c., Pittsburgh, is now quite general on the larger lots and 1.85c. on the smaller lots.

Structural steel bookings amounted to 29,000 tons, with 25,000 tons additional under negotiation. Chief among the awards were the New York Athletic Club, 6100 tons, and a New York bank building, 6000 tons. A telephone building in New York now being bid on calls for 4000 tons.

Concrete reinforcing steel contracted for in the week amounted to 12,000 tons, including 3100 tons for a viaduct at Los Angeles, 2000 tons for a warehouse in Cleveland and 1600 tons for a Pittsburgh warehouse. In new projects, some 7700 tons are under negotiation.

Third quarter buying of pig iron has begun at Cleveland, where 20,000 tons was sold. Because of a considerable carryover and a slowing down of foundry operations, sales for next quarter are not expected to equal those of the current three-month period. Prices show little change.

Heavy melting steel scrap at Pittsburgh has declined 50c. to $15, breaking through the low level of a year ago without arousing consumer interest. Steel makers are well stocked with scrap and, with no prospects of heavier melt, are not disposed to make speculative purchases. Cincinnati reports the third 25c. reduction in a month. Large accumulations of scrap in Texas, which would ordinarily reach the St. Louis market, have been diverted to Japan and Italy at higher prices.

Spot offerings of furnace coke at Connellsville are more than ample to satisfy the demand.

German concrete reinforcing bars, totaling about 1600 tons, will be used in some of the New York subway work and in the New York-New Jersey vehicular tunnel. On competition for 2000 tons for Philadelphia sewer work, a Pittsburgh mill had to go some $6 under the domestic quotation and its price, even then relatively high, was accepted because of better distribution of deliveries. Export business has brought cuts of $7 and as high as $10 a ton.

THE IRON AGE finished steel composite price has advanced from 2.367c. a lb. to 2.374c. Pig iron composite remains unchanged for the third week at $19.07 a ton.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	May 31, 1927	May 24, 1927	May 3, 1927	June 1, 1926
No. 2, fdy., Philadelphia	$21.76	$21.76	$21.76	$22.26
No. 2, Valley furnace	18.50	18.50	18.50	18.00
No. 2, Southern, Cin'ti	21.69	21.69	21.69	25.69
No. 2, Birmingham	18.00	18.00	18.00	22.00
No. 2 foundry, Chicago*	20.00	20.00	20.00	21.50
Basic, del'd eastern Pa.	20.75	20.75	20.75	21.75
Basic, Valley furnace	18.00	18.00	18.50	18.00
Valley Bessemer, del. P'gh	20.76	20.76	21.26	20.76
Malleable, Chicago*	20.00	20.00	20.00	21.50
Malleable, Valley	18.50	18.50	18.50	18.50
Gray forge, Pittsburgh	19.76	19.76	19.76	19.26
L. S. charcoal, Chicago	27.04	27.04	27.04	29.04
Ferromanganese, furnace	90.00	90.00	95.00	88.00
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	34.00
Bess. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. sheet bars, P'gh	33.50	33.50	34.00	36.00
Forging billets, P'gh	39.00	39.00	39.00	40.00
O.-h. billets, Phila	39.30	39.30	39.30	40.30
Wire rods, Pittsburgh	42.00	42.00	42.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.90	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.22
Iron bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh	1.85	1.85	1.85	2.00
Steel bars, Chicago	2.00	2.00	2.00	2.10
Steel bars, New York	2.19	2.19	2.19	2.34
Tank plates, Pittsburgh	*1.80*	1.85	1.85	1.85
Tank plates, Chicago	2.00	2.00	2.00	2.10
Tank plates, New York	*2.1¼*	2.19	2.19	2.24
Beams, Pittsburgh	1.80	1.80	1.80	1.90
Beams, Chicago	2.00	2.00	2.00	2.10
Beams, New York	2.14	2.14	2.14	2.24
Steel hoops, Pittsburgh	2.30	2.30	2.30	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	May 31, 1927	May 24, 1927	May 3, 1927	June 1, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	**3.00**	2.90	2.70	2.95
Sheets, black, No. 24, Chicago dist. mill	3.10	3.10	2.95	3.15
Sheets, galv., No. 24, P'gh.	**3.85**	3.75	3.60	3.85
Sheets, galv. No. 24, Chicago dist. mill	3.95	3.95	3.85	4.15
Sheets, blue, 9 & 10, P'gh.	2.25	2.25	2.15	2.35
Sheets, blue, 9 & 10, Chicago dist. mill	2.35	2.35	2.35	2.60
Wire nails, Pittsburgh	2.50	2.50	2.50	2.65
Wire nails, Chicago dist. mill	2.55	2.55	2.60	2.70
Plain wire, Pittsburgh	2.40	2.40	2.40	2.50
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh	3.20	3.20	3.25	3.35
Barbed wire, galv., Chicago dist. mill	3.25	3.25	3.30	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	$13.75	$13.75	$14.25	$15.00
Carwheels, Philadelphia	16.00	16.00	16.00	17.00
Heavy melting steel, P'gh.	*15.00*	15.50	15.50	15.00
Heavy melting steel, Phila.	14.00	14.00	14.50	15.00
Heavy melting steel, Ch'go	12.25	12.25	12.75	12.00
No. 1 cast, Pittsburgh	15.50	15.50	16.00	16.00
No. 1 cast, Philadelphia	16.50	16.50	17.00	17.00
No. 1 cast, Ch'go (net ton)	*15.00*	15.50	16.50	15.75
No. 1 RR. wrot. Phila.	16.50	16.50	16.50	17.00
No. 1 RR. wrot. Ch'go (net)	11.00	11.00	11.75	10.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.90	$2.90	$3.00	$3.00
Foundry coke, prompt	4.00	4.00	4.00	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*12.75*	12.87½	13.12½	14.00
Electrolytic copper, refinery	*12.37½*	12.43	12.75	13.57½
Zinc, St. Louis	6.07½	6.07½	6.12½	6.95
Zinc, New York	6.42½	6.42½	6.47½	7.30
Lead, St. Louis	*6.02½*	6.15	6.40	7.45
Lead, New York	*6.37½*	6.50	6.75	7.65
Tin (Straits), New York	*67.00*	67.75	67.00	60.62½
Antimony (Asiatic), N. Y.	*13.25*	13.50	13.00	9.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Steel Buying Is at Shorter Range But Sustains 70 Per Cent Output

PITTSBURGH, May 31.—The general tendency of steel buying is still downward, but the shrinkage is seen in the size rather than in the number of sales, which reach a total sufficient to sustain an ingot output of 70 per cent of capacity for this and nearby districts.

In a few finished products specifications have fully equaled shipments in the past month. A notable and significant case of this sort is in strip steel, in which liberal coverage was given buyers against their second quarter requirements prior to an advance in prices. Producers generally have advised their customers that tonnages not specified by June 15 for shipment by July 1 will be cancelled. Evidently buyers regard seriously the effort of producers to establish the present prices on third quarter tonnages and are freely specifying on remaining second quarter contracts. Some makers of cold-finished steel bars also have had specifications as large as shipments in the past month. While the same cannot be said of finished products, the fact that there has been little numerical decline in orders, in keeping with the propensity of consumers to buy in even closer step with their actual requirements, probably means that May as a whole will make a good showing in comparison with that month last year and the year before. Producers still emphasize the even flow of demand from the consuming industries not usually classified and the miscellaneous tonnages from large consumers who could not anticipate the demands upon them.

Prices are still irregular. There is a good deal of earnestness among the sheet manufacturers in their efforts to establish the advances announced about a month ago. Indeed, the market is now quotable at these advances, since buyers have not been successful lately in developing lower prices on such tonnages as they have required. A similar determination is evidenced by strip steel manufacturers. In tin plate, on one attractive order on which several makers quoted, the lowest price was $5.40 per base box, Pittsburgh, a concession of only 10c. from the base price, whereas only a few weeks ago the base quotation was being shaded by 25c. and on one order for less than 100,000 boxes the price went very close to $5 per base box.

There is little real strength in bars, plates and shapes, and in wire products the price situation is still unsettled, but in all of these products the market seems to be stronger in the Pittsburgh district than in other markets.

All makers of bolts and nuts are not holding rigidly to the prices announced effective April 1.

The scrap market has broken through its low level of a year ago, with consumer interest still absent. Hardly enough pig iron business is passing to seriously test prices. The market in coal and coke is still depressed, and even the reduction ordered by the Interstate Commerce Commission in the freight rates on coal from the Pittsburgh district to the lower Lake ports has not proved a stimulating factor.

Pig Iron.—Business in this market is almost at a standstill. No interest is apparent in basic iron, and only occasional carloads of Bessemer iron are being sold, while a transaction in foundry iron embracing more than a carload is an exception. The Richmond Radiator Co., Uniontown, Pa., has been in the market for 2000 tons of foundry iron, but there is no information as to whether it has closed, as the purchasing is

done in New York. Every time the stack of the Clinton Iron & Steel Co. goes down there is a report that its property has been sold to the Pittsburgh & Lake Erie Railroad, which several years ago made an offer for the site for the purpose of enlarging its terminal facilities here. This report again is current, but finds no confirmation.

Prices per gross ton f.o.b. Valley furnace:

Basic	$18.00
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	18.50
Low phosphorus, copper free	28.00

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Ferroalloys.—Definite offerings of ferromanganese at $90, Atlantic seaboard, by British makers have forced another revision, the second in a month, in the price of domestic material, which is also quoted at $90. This price, which applies on unshipped and unspecified contract tonnages, became effective May 24, the day after British material definitely declined to $90. It is understood here that British makers succeeded in getting some business at this price, as one domestic producer is said to have released its customers instead of meeting the new quotation. The belief is common that at $90 the market is as low as it is going, as on the basis of the British home market price of £12, there is absorption of freight and brokerage charges by shippers to bring about parity between £12 abroad and $90, duty paid, at ports of entry. Domestic producers have cut to $90, not because they can do so profitably, but chiefly to retain control of the American market. Leading consumers of spiegeleisen in the past week or 10 days have covered for their last half requirements at the same prices that they paid on first half supplies. New business in high grade ferrosilicon does not amount to much, as consumers generally are covered for the year.

Semi-Finished Steel.—There is very little activity in any form of semi-finished steel. Manufacturers who buy instead of making their own steel are not showing much interest in their third quarter requirements, and since June does not promise to be so good an operating month as May, they are not freely ordering out the steel that they have under contract. Prices of billets, slabs and sheet bars are where they were a week ago, but they are based on contract shipments rather than on new sales. Wire rods are still quoted at $42 to $43, base, Pittsburgh or Cleveland, but these prices are obtainable only for small tonnages and then chiefly on shipments within the greater Pittsburgh area. Competition is bringing out lower prices in the East, where as low as $40 and $41, Pittsburgh, is reported. Skelp is not moving with much freedom, because of the rather slack demand for most kinds of pipe.

Steel and Iron Bars.—The Pittsburgh district market for steel bars is steady as to prices and is making a fairly good showing as to orders, which, while individually small and for very prompt shipment, representing requirements that buyers could not anticipate, make a sizable total. Mill scheduling is still at short range. There is no evidence that less than 1.90c., base Pittsburgh, is being done in this market or a little to the west on the ordinary tonnages, but going east, Pittsburgh mills are confronted with an ordinary tonnage price of 1.90c. and even 1.85c., base Buffalo, which they must meet to retain consuming connections. Delivered prices quoted by other Eastern mills also figure out well under 1.90c. at Pittsburgh. Iron bars are moving fairly steadily, but not in large amounts, and the local price of 2.75c. for refined iron bars is based on small tonnages.

Structural Steel.—Local producers of large structural shapes are still getting 1.90c., base Pittsburgh, for small tonnages for shipment within the Pittsburgh district and for a short distance west of Pittsburgh, but cannot get that price going east on account of the competition of Eastern mills. Prices of large tonnages regardless of destination are still determined by their desirability, with competition sharper in the East than in most other sections of the country. Considerable office and public building work is in sight in this district, with a 22-story office building for the Koppers Co., the latest addition to the prospective list. Some fabricating shops are busy, while others need business.

Plates.—The general Pittsburgh market is quotable from 1.80c. to 1.90c., according to the size of the tonnage, but on orders of more than a carload, 1.85c. is all that can be readily obtained and railroad car plates are reported to have been placed at less than 1.80c.

Wire Products.—Against irregularity and weakness elsewhere, notably in the Northwest and in the South, the Pittsburgh market is very steady, despite the fact that no success has attended the effort to maintain $2.55, base, per keg, Pittsburgh, on nails and prices to correspond on staples and galvanized barbed wire. In the South, some makers are making prices calculated to overcome the competition of imported goods. There is a convergence of competition on Northwestern consuming points and along the Northeastern seaboard there seems to be something of a struggle for orders, not only for nails, but for annealed wire, sales of which are reported at as low as $2.45, which, assuming the maintenance of the regular annealing extra of 15c. per 100 lb., would figure back to $2.30 for plain wire. Jobbers do not seem to be disposing of purchases as rapidly as was expected, and producers seem to believe that repeat orders will be brought out by lower prices.

Rails and Track Supplies.—These lines are quiet, as is usually the case at this time of the year, when the railroads are well supplied so far as summer tracklaying programs are concerned and have not formulated plans for the future. Prices are unchanged and untested.

Tubular Goods.—There is still a good engagement of capacity in large lapwelded pipe on line pipe orders, but mills as a whole are not operating at more than 65 per cent. A higher rate often is noted when the market is no more active than at present, but since few expect the oil industry to emerge from its depression this year, there is less inclination to add to mill stocks than would be the case with brighter prospects. Jobbers are depending upon the mills to make deliveries as they are wanted, and this dependence is not misplaced, especially as requirements are materially

The Iron Age Composite Prices

Finished Steel

May 31, 1927, 2.374c. a Lb.

One week ago	2.367c.
One month ago	2.339c.
One year ago	2.410c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4;	2.339c.,	April 26
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	April 24;	2.446c.,	Jan. 2

Pig Iron

May 31, 1927, $19.07 a Gross Ton

One week ago	$19.07
One month ago	19.13
One year ago	20.39
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	$19.71,	Jan. 4;	$18.96,	Feb. 15
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	March 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
Del'd Philadelphia	2.17c. to 2.22c.
Del'd New York	2.19c. to 2.24c.
Del'd Cleveland	2.09c.
F.o.b. Cleveland	1.85c. to 1.90c.
F.o.b. Birmingham	2.05c. to 2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.90c.
F.o.b. Birmingham	2.00c.

Rail Steel

F.o.b. mill	1.70c. to 1.80c.
F.o.b. Chicago	1.90c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill	1.80c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	1.95c. to 2.05c.
Del'd Cleveland	2.09c.
Del'd Philadelphia	2.12c. to 2.22c.
Del'd New York	2.14c. to 2.24c.
C.i.f. Pacific ports	2.25c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.09c.
Del'd Philadelphia	2.07c. to 2.22c.
Del'd New York	2.09c. to 2.24c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh	2.30c.
All gages, 6 in. to 12 in., P'gh	*2.10c.
Nos. 13 and 14 gage, 12 in. to 14 in., P'gh, net	2.30c.
Nos. 15 and 16 gage, 12 in. to 14 in., P'gh, net	2.40c.
All gages, narrower than 6 in., Chicago,	2.40c. to 2.60c.
All gages, 6 in. and wider, Chicago,	2.30c. to 2.50c.

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.40c.
Bars, f.o.b. Chicago	2.40c.
Bars, Cleveland	2.35c.
Shafting, ground, f.o.b. mill	*2.55c. to 3.00c.
Strips up to 12 in., f.o.b. Pittsburgh mill	3.00c. to 3.25c.
Strips up to 12 in., f.o.b. Cleveland mills	3.00c. to 3.25c.
Strips up to 12 in., delivered Chicago	3.30c. to 3.55c.
Strip sheets, 12 in. and wider, Pittsburgh mill	3.00c.
Strip sheets, 12 in. and wider, Cleveland mill	3.00c.
Strip sheets, 12 in. and wider, Chicago mill	3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.50
Galv'd nails	4.50
Galvanized staples	3.20
Polished staples	2.95
Cement coated nails	2.50

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	$2.45 to 2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	3.20
Barbed wire, painted	2.95

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.25c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.35c.
Nos. 9 and 10, del'd Philadelphia	2.57c.
Nos. 9 and 10, f.o.b. Birmingham	2.35c. to 2.45c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	3.00c.
No. 24, f.o.b. Ch'go dist. mill	3.10c.
No. 24, del'd Philadelphia	3.32c.
No. 24, f.o.b. Birmingham	3.10c. to 3.15c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	4.10c.
No. 24, f.o.b. Pittsburgh, B grade	4.00c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.85c.
No. 24, f.o.b. Chicago dist. mill	3.95c.
No. 24, del'd Philadelphia	4.17c.
No. 24, f.o.b. Birmingham	3.95c. to 4.05c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.10c.
No. 28, f.o.b. Chicago dist. mill	3.20c.

Automobile Body Sheets

No 20, f.o.b. Pittsburgh	4.15c. to 4.25c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.20c. to 4.30c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.40
8-lb. coating I.C.	11.70
15-lb. coating I.C.	14.85
20-lb. coating I.C.	$16.20
25-lb. coating I.C.	17.90
30-lb. coating I.C.	19.45
40-lb. coating I.C.	21.65

Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(1½% Nickel, 0.10% to 0.20% Carbon)	$3.00 to $3.15
2300	(3½% Nickel)	4.30 to 4.40
2500	(5% Nickel)	5.50
3100	(Nickel Chromium)	3.30 to 3.40
3200	(Nickel Chromium)	4.75 to 5.00
3300	(Nickel Chromium)	7.00 to 7.25
3400	(Nickel Chromium)	6.25 to 6.50
5100	(Chromium Steel)	3.30 to 3.40
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.20 to 4.30
6100	(Chrom. Vanad. spring steel)	3.80
9250	(Silicon Manganese spring steel)	3.20 to 3.25
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.20 to 4.30
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.25 to 4.35
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.40 to 3.50
	Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	$36.00 to 38.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ⅝ in. and larger	$2.80 to $3.00
Spikes, ½ in. and smaller	2.80 to 3.15
Spikes, boat and barge	3.25
Tie plates, steel	2.35
Angle bars	2.75
Track bolts, ⅞ in. and ⅞ in.	3.90 to 4.00
Track bolts, ¾ in. and smaller, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	15
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

smaller than they were a year ago. Prices are holding well despite the light demand, because there is a common tendency among pipe makers to preserve prices even if that means a curtailment of production. Incidentally, present pipe prices have been in effect for considerably more than four years.

Sheets.—The market is now squarely quotable at the prices announced late in April on black, galvanized and blue annealed sheets, or at 3c., 3.85c., and 2.25c., base Pittsburgh, respectively. To be sure, only small demands are being made upon the mills, as buyers generally were given protection to at least the end of June at prices ruling prior to the advance, but there are some requirements that buyers could not foresee and on these the mills are unwilling to go under their asking prices. It is a fact that the prices are supported by only a small percentage of the present shipments, but the only market that exists at present is in the small-lot tonnages that are coming out. Automobile body builders have not yet had to supplement contract purchases, and 4.25c., base, for body sheets is not yet fully established, but all makers are quoting that price.

Tin Plate.—There is no more activity in tin plate than there usually is at this time of the year, when the can companies are watching crop news and noting packing activities rather than making purchases. There is little doubt that the pack of peas and corn will be smaller than last year and the year before, but it is expected that increased packs of pineapples and other fruits will in some measure make up for the lighter demands for those vegetables. In the meantime general line cans are taking quite as much tin plate as last year. Tin plate prices are stronger and the effort is still being made to put small-lot buyers on the full base price and to reduce the preferential to the larger buyers.

Cold-Finished Steel Bars and Shafting.—Orders are more notable for their number than size, but the aggregate of bookings is fairly satisfactory, and some makers report that specifications for the month equaled their shipments. The market is still quotable at 2.40c., base Pittsburgh, for small lots and at 2.30c. to the large buyers. There is much speculation as to the requirements of the Ford Motor Co. for its new model, but that company is yet to appear in the market with actual specifications for bars or other steel parts for the new car.

Hot-Rolled Flats. — Specifications against second quarter tonnages have been stimulated by the fact that manufacturers have advised their customers that tonnages unspecified by June 15 for shipment by July 1 will be cancelled. Buyers, regarding it as unlikely that they will be able to buy as cheaply again, are sending in their orders. It is too early for much third quarter business, and it is probable that formal contracts for that period will be lighter and fewer than those for this quarter, since there is not the same price incentive for advance buying that there was for the quarter drawing to a close.

Cold-Rolled Strips.—Makers, applying the same rule to this product as on hot-rolled strips, are getting increased specifications on second quarter contracts by threatening to cancel tonnages not ordered for shipment by July 1.

Bolts, Nuts and Rivets.—The market in this district is fairly active and steady, but in other markets there is some evidence that all makers are not holding rigidly to the present prices of bolts and nuts. Buyers seem to be holding back specifications on contracts carrying lower prices with an idea of extending them into the third quarter, and there is some shading to win early specifications. Rivets appear to be holding well at the advanced prices, but there was a good deal of covering by consumers and jobbers before the advance became effective.

Coke and Coal.—Spot offerings of furnace coke are more than ample for the demand, and it is evident that something more than curtailment of production is necessary to bring about a stronger price situation. On freshly drawn 48-hr. coke, producers are asking and obtaining from $2.90 to $3 per net ton at ovens, but there are few producers who do not have loaded cars that they are anxious to move and on which they are glad to get $2.75. Spot foundry coke still ranges from $4 to $4.50 for good brands and from $5 to $5.50 for special brands made from carefully prepared coal. The coal market shows very little life and no more strength than recently has been noted.

Old Material.—Prices of most grades of scrap are just about where they were a week ago, but there is little or no consumer interest either in fresh supplies or in getting shipments on old orders. Consequently dealers are not very active buyers. Business is almost at a standstill, because dealers, recalling the disastrous experiences of a year ago when they made sales at prices that were substantially where they are now, are loath to sell short. Heavy melting steel has been offered the mills in moderate quantities at $15.50 and has been turned down, but the steel makers generally are so well supplied that their reluctance to buy is less a question of price than one of requirements. When the mills see signs of improved operations they will want scrap and pay the price, but there are few who will speculate to the extent of buying when the need is not present. Dealers are able to secure heavy melting at $15, and as they are not offering more, that price is more representative of the market's possibilities than $15.50. Lower prices for heavy breakable cast scrap, the railroad special grades, and in turnings, borings, etc., are attributable to the fact that consumers are not interested while dealers have caught up with their short orders. The June scrap list of the Pennsylvania Railroad contains 45,198 tons. The June offering of the Baltimore & Ohio Railroad totals 17,365 tons.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel	$15.00 to $15.50
Scrap rails	14.50 to 15.00
Compressed sheet steel	14.00 to 14.50
Bundled sheets, sides and ends	13.00 to 13.50
Cast iron carwheels	$15.50 to 16.00
Sheet bar crops, ordinary	16.00 to 16.50
Heavy breakable cast	14.00 to 14.50
No. 2 railroad wrought	15.50
Heavy steel axle turnings	14.00 to 14.50
Machine shop turnings	10.50 to 11.00
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers	17.00 to 17.50
Railroad coil and leaf springs	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Low phosphorus billet and bloom ends	20.00 to 20.50
Low phosphorus, mill plate	19.50 to 20.00
Low phosphorus, light grade	17.00 to 17.50
Low phosphorus sheet bar crops	19.00 to 19.50
Heavy steel axle turnings	14.00 to 14.50
Electric Furnace Grades:	
Low phosphorus punchings	18.00 to 18.50
Heavy steel axle turnings	14.00 to 14.50
Blast Furnace Grades:	
Short shoveling steel turnings	10.50 to 11.00
Short mixed borings and turnings	10.50 to 11.00
Cast iron borings	10.50 to 11.00
No. 2 busheling	10.50 to 11.00
Rolling Mill Grades:	
Steel car axles	20.50 to 21.00
No. 1 railroad wrought	12.50 to 13.00
Cupola Grades:	
No. 1 cast	15.50 to 16.00
Rails 3 ft. and under	18.00 to 18.50
Malleable Grades:	
Railroad	15.50
Industrial	15.00
Agricultural	14.50

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c. to 3.65c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.60c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.30c.
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, ¾ in. and smaller, per 100 count.	62½ per cent off list
Machine bolts, per 100 count.	62½ per cent off list
Carriage bolts, per 100 count.	62½ per cent off list
Nuts, all styles, per 100 count.	62½ per cent off list
Large rivets, base per 100 lb	$3.50
Wire, black soft annealed, base per 100 lb	2.90
Wire, galvanized soft, base per 100 lb	2.90
Common wire nails, per keg	$2.80 to 2.90
Cement coated nails, per keg	2.85 to 2.95

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾-in.	$33.50 to 34.00
Forging, ordinary	39.00 to 40.00
Forging, guaranteed	44.00 to 45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$33.50 to $34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	$33.50 to 34.00

Skelp

	Per Lb.
Grooved	1.80c. to 1.90c.
Sheared	1.80c. to 1.90c.
Universal	1.80c. to 1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$42.00 to $43.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $42.50 to $44. Cleveland mill base, $42 to $43.

Prices of Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.50c.
Iron ore, Swedish, average 66% iron,	9.75c. to 10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50%	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates	$11.00 to $11.50
	Per Gross Ton
Chrome ore, Indian basic, 48% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.50
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.90 to $3.00
Foundry, f.o.b. Connellsville prompt	4.00 to 4.50
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	12.00
Foundry, by-product, Newark or Jersey City, delivered	9.59 to 10.77
Foundry, Birmingham	5.50 to 6.00
Foundry, by-product, St. Louis	10.25

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.30 to $1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.80 to 2.00
Mine run gas coal, f.o.b. Pa. mines	2.00
Steam slack, f.o.b. W. Pa. mines	1.25
Gas slack, f.o.b. W. Pa. mines	1.40 to 1.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$90.00
Foreign, 80%, Atlantic or Gulf port, duty paid	90.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$36.00 to $37.00
Domestic, 16 to 19%	36.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00 to $87.50
75%	145.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
10%	$34.00	12%	$38.00
11%	36.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
6%	$26.50	10%	$32.00
7%	27.50	11%	34.00
8%	28.50	12%	36.00
9%	30.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd ..... $1.00 to $1.05
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads ..... 11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace ..... $3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads $200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton $91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton $122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$17.00 to $18.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	———
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
*Machine bolts	70
*Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagon	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago and Pittsburgh. †Bolts with rolled threads up to and including ⅜ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60 and 5

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75
F.o.b. Chicago	2.85

Small Rivets

(⅞-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread,	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

More Interest in Third Quarter Steel—Sheet Output at 90 Per Cent

CHICAGO, May 31.—Users of steel are showing greater interest in third quarter requirements, and sales have gained, approximately equaling shipments in the past week. The heaviest demand comes from buyers of bars and plates, structural material still being relatively sluggish. There is little change in the volume of specifications, and mills will start June at the same rate of ingot production that was maintained in the last half of May.

Several sizable orders for oil storage tanks have been placed. This business came as a surprise to sellers, who are still of the impression that tank-building programs will be light in the immediate future. Miscellaneous orders for standard-section rails bulk fairly large, and specifications for track accessories have pushed production to the highest point of the year. The railroad equipment market remains dull, but it is believed in some quarters that the Illinois Central will place orders within a week or 10 days. Figures compiled by steel producers indicate that freight car purchases to date this year exceed by about 25 per cent the total for the corresponding period of 1926.

Deliveries on bars range from three to five weeks, which as a general rule are satisfactory to users. Many individual orders for plates and shapes are so small and mixed that mills are forced to let tonnage accumulate before rolling schedules for certain sizes can be arranged. Therefore instead of obtaining prompt deliveries, as would be expected when mills are operating on a week-to-week basis, buyers are often forced to accept delayed shipments.

Pig Iron. — Greater activity is being shown in heavier spot sales of Northern iron for delivery in 30 to 60 days. The tonnages being taken, however, are small, the average being well below 200 tons each. In Chicago $20, furnace, is still the going base price, but a sale of 1000 tons in Iowa disclosed a price of $21.81, delivered, or $19.50, Chicago district furnace. Shipments of foundry iron in May were a trifle heavier than in April, and with hold-up orders less numerous the May rate is carrying into the first week of June. Several small orders for 14 to 15 per cent Bessemer ferrosilicon have been placed. There has been a moderate number of carlot sales of low phosphorus iron and silvery.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	24.01
Southern No. 2 (barge and rail)	22.18
Low phos., sil. 1 to 2 per cent, copper free	$31.50 to 32.00
Silvery, sil. 8 per cent	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered at consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—Lower prices for ferromanganese are having little effect upon the local market, current sales being few in number and of carlot proportions. The demand for spiegeleisen is light, and prices lack strength at $42.56, delivered, for the 18 to 22 per cent grade. Spot sales of ferrosilicon are small, but specifications against contracts are in good volume.

Prices delivered Chicago: 80 per cent ferromanganese, $97.56; 50 per cent ferrosilicon, $85 to $87.50; spiegeleisen, 18 to 22 per cent, $42.56.

Plates.—Oil producers in the Southwest have placed orders for 6500 tons of plates for tanks, and an additional 4000 tons is being actively figured on. The plate market is showing more activity than in a number of weeks, and new buying is now about equal to shipments. Competition for going tonnage is keen, however, and prices are weak, especially on attractive tonnages, on which some quotations have been as low as 1.90c., Chicago. The purchase of cars by the Illinois Central has been deferred about 10 days. Railroad equipment orders for the week include 300 underframes and 18 passenger cars. A report that the Chicago & North Western will come into the market for 2500 miscellaneous freight cars is given little credence in some quarters because that road has been carrying on a sizable car-building program in its own shops. A survey of car purchases indicates that to date in 1927 the railroads have purchased 40,100 freight cars and 1350 passenger cars, or 20 per cent and 27 per cent more respectively than in the corresponding period of 1926.

Mill prices on plates per lb.: 2c., Chicago.

Structural Material.—The demand for structural material shows no improvement, and prices obtained by fabricators are at or close to the low point of the year. Mill prices lack strength, and in few instances 1.90c., Chicago, has been quoted on desirable tonnages of plain material. On the average order, however, 2c. still rules. Specifications are light, averaging close to those of the previous week. A public utility building at Denver calls for 4000 tons, and a theater building in Chicago will take 500 tons. New projects continue to come out freely and call for a larger tonnage than current lettings.

Mill prices on plain material per lb.: 2c., Chicago.

Bars.—The demand for soft steel bars has improved materially, both new buying and specifications being about equal to shipments. Tractor and combine manufacturing plants are reported busy, but other branches of the agricultural implement trade are dragging. Specifications from the automobile trade are steady, and several motor car builders have signified their intention of making out July schedules at an early date. Makers of cold-rolled bars are finding business rather slow and are releasing smaller specifications on hot-rolled bars. The ruling price on billet steel bars is now 2c., Chicago. Orders usually are small and for mixed tonnages. The price of 2c. has not been tested by attractive tonnages. Specifications for iron bars are in fair volume, but they are still far out of line with productive capacity in this district. Spot sales are light, and prices are holding at 2c., Chicago. Users are taking alloy steel bars at a steady rate, and prices are unchanged. Specifications for rail steel bars in May were in larger volume than for any previous month this year. Production is holding at a uniform rate and compares favorably with the peak month, which was March. Farm implement manufacturers are slightly more active, but their business prospects are uncertain and they are specifying in close step with immediate needs. Specifications for hard steel concrete bars have grown rapidly in recent weeks, and mills are having some difficulty in keeping stocks balanced. Prices on rail steel bars have definitely settled to 1.90c., Chicago, with only an occasional small and mixed lot bringing 2c.

Mill prices per lb.: Soft steel bars, 2c., Chicago; common bar iron, 2c., Chicago; rail steel bars, 1.90c., Chicago.

Rails and Track Supplies.—Miscellaneous orders for track accessories totals 5000 tons, the largest being for 1700 tons. Production is tending upward and has now reached the highest point of the year. The Chesapeake & Ohio has made a tentative inquiry for track supplies. Orders for standard-section rails total 1500 tons. Rail mill operations in this district are holding at 80 per cent of capacity.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36 to $38. *Per Lb.:* Standard railroad spikes, 2.90c.; track bolts with square nuts, 3.90c.; steel tie plates, 2.35c.; angle bars, 2.75c.

Sheets.—As a result of a pickup in demand late in May, that month compared favorably with April in specifications and shipments. Mills start the new month with better order books and a higher rate of operations than at the beginning of April. New buying, consisting almost wholly of small orders for immediate consumption, is improving, and specifications warrant a mill operation of 90 per cent of capacity in the first week of June. Orders from jobbers in the flooded areas are less numerous, and the trade believes this to be the result of hesitancy in extending credit to small buyers in rural sections. The manufacturing trade is taking blue annealed sheets in larger quanti-

ties. Buyers are offering little or no resistance to prices.

Prices per lb., delivered from mill in Chicago: No. 24 black, 3.15c.; No. 24 galvanized, 4c.; No. 10 blue annealed, 2.40c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Wire Products.—The jobbing trade is gradually tapering. Considering the lateness of the season the demand from that source is good, this being due in large measure to the fact that jobbers have persistently held their stocks down and have little or no supply on hand from which to draw for the current run of business. The spring rush for nails is over, but stock replenishment orders are fairly numerous and afford a fair rate of operation in nail mills. Damage by floods to fences is resulting in a more active demand for woven wire fencing and, particularly, for barbed wire and staples. Specifications from the manufacturing trade were a trifle lighter as the month of May closed. Mill stocks are said to be of good size in most lines. Production of wire products is pointing downward, mills in this district now averaging 55 per cent to 60 per cent of capacity. Plain wire is steady at $2.45 per 100 lb., Chicago. Wire nails are being quoted at $2.55 to $2.60 per keg, delivered Chicago. Cement coated nail prices, which had been shaded as much as $2 a ton, are gaining strength.

Cast Iron Pipe.—Buying of pipe in large quantities in and near Chicago is slow. This is not unusual, however, at this time of the year. Spring requirements are well covered, and if there is to be a buying movement for delivery in July and August, it is not uncommon for it to get under way toward the middle of June. Public utilities, particularly the gas companies, are withdrawing from the market, having placed the bulk of their requirements for the near future. All told, new business is falling short of shipments, and deliveries are improving, now averaging about 30 days. The American Cast Iron Pipe Co. is low bidder on 200 tons of 3-in. to 24-in. fittings for Chicago. Detroit is readvertising for prices on 3000 tons of 26-in. pipe. Green Springs, Ohio, will open bids June 3 on 350 tons of 4 to 8-in. pipe, and St. Clair Shores, Mich., will receive tenders June 7 on 4625 tons of 12-in. Class C and 1150 tons of 8-in. Class B pipe. The price situation shows little or no variation, buyers having no difficulty in obtaining small tonnages at $36, base Birmingham, or $44.20, delivered, Chicago.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $43.20 to $44.20; 4-in., $47.20 to $48.20; Class A and gas pipe, $4 extra.

Hot-Rolled Strip.—Specifications are liberal, especially from automobile manufacturers. New buying is sluggish and in small lots.

Cold-Rolled Bars.—Both specifications and new business have dropped off rapidly. Automobile builders are using smaller quantities, and the demand from the general manufacturing trade is also less active. The bulk of going business is being taken at 2.40c., Chicago.

Reinforcing Bars.—Awards of reinforcing bars have not been in the volume expected at this time of the year, but nevertheless the aggregate of contracts placed has steadily increased, as indicated by shipments from warehouse, which are now at the rate of 75 per cent of capacity as against 60 per cent early in May. Pending business promises further improvement in June, in the opinion of the trade. Fresh inquiry is in good volume, and the average size of new projects is larger than earlier in the spring. The price situation is not clearly defined. As a rule, billet steel reinforcing bars are being quoted at 2.30c. to 2.75c., Chicago warehouse, but here and there 2.25c. is named on business that is considered unusually competitive. Rail steel reinforcing bars are steady at 2.10c. to 2.55c., Chicago. Contracts recently awarded and fresh inquiries are shown on page 1643.

Bolts, Nuts and Rivets.—Specifications for bolts and nuts from the railroads are in smaller volume, but the aggregate of all orders is equal to that of the previous week. Users of small rivets are taking liberal quantities. Prices of these products are steady.

Coke.—Shipments of by-product foundry coke in this district are steady, and contract prices are unchanged at $9.75, ovens, and $10.25, delivered in the Chicago switching district.

Old Material.—Prices continue to drop in a market that is unusually dull, with supplies ample in practically all grades of scrap. In some quarters it is believed that the market has touched bottom, and there is evidence that dealers are again willing to speculate. Several sizable railroad lists are being advertised, and bidding on them is active. Sales for the most part are small, and outcoming tonnage is being applied against old contracts, which in the main have not long to run. Buyers' inspections are rigid, and several large users are restricting shipments. Further evidence that prices, at least on some specialties, have reached bottom, is indicated by the willingness of some dealers to pay prices a step above their offers of a week ago. Railroad lists include 50,000 tons offered by the Pennsylvania, 5300 tons advertised by the Santa Fe and a blank list from the Michigan Central.

Prices delivered consumers' yards, Chicago:

Per Gross Ton

Basic Open-Hearth Grades	
Heavy melting steel	$12.25 to $12.75
Shoveling steel	12.25 to 12.75
Frogs, switches and guards, cut apart, and miscellaneous rails	13.25 to 13.75
Hydraulic compressed sheets	10.25 to 10.75
Drop forge flashings	9.50 to 10.00
Acid Open-Hearth Grades	
Forged, cast and rolled steel carwheels	14.50 to 15.00
Railroad tires, charging box size	14.75 to 15.25
Railroad leaf springs, cut apart	14.75 to 15.25
Steel couplers and knuckles	14.50 to 15.00
Coil springs	15.00 to 15.50
Low phosphorus punchings	14.50 to 15.00
Electric Furnace Grades	
Axle turnings	11.75 to 12.25
Blast Furnace Grades	
Axle turnings	10.00 to 10.50
Cast iron borings	9.75 to 10.25
Short shoveling turnings	9.75 to 10.25
Machine shop turnings	7.00 to 7.50
Rolling Mill Grades	
Iron rails	13.50 to 14.00
Rerolling rails	14.75 to 15.25
Cupola Grades	
Steel rails, less than 3 ft	15.50 to 16.00
Angle bars, steel	13.50 to 14.00
Cast iron carwheels	13.75 to 14.25
Malleable Grades	
Railroad	13.50 to 14.00
Agricultural	13.50 to 14.00
Miscellaneous	
*Relaying rails, 56 to 60 lb	25.50 to 26.50
*Relaying rails, 65 lb. and heavier	26.00 to 31.00

Per Net Ton

Rolling Mill Grades	
Iron angle and splice bars	13.50 to 14.00
Iron arch bars and transoms	18.50 to 19.00
Iron car axles	20.50 to 21.00
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.50 to 11.00
No. 1 busheling	9.25 to 9.75
No. 2 busheling	6.00 to 6.50
Locomotive tires, smooth	14.25 to 14.75
Pipes and flues	7.50 to 8.00
Cupola Grades	
No. 1 machinery cast	15.00 to 15.50
No. 1 railroad cast	14.00 to 14.50
No. 1 agricultural cast	13.75 to 14.25
Stove plate	12.50 to 13.00
Grate bars	11.50 to 12.00
Brake shoes	10.50 to 11.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.30c. to 2.75c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.

	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60

No. 8 black annealed wire, per 100 lb.	$3.20
Common wire nails, base per keg	$2.85 to 2.95
Cement coated nails, base per keg	2.95

New York

Sheets Sold at the Higher Prices—1000 Tons of German Bars Bought

NEW YORK, May 31.—The pig iron market has been unusually quiet during the week, and sales by local brokers barely exceeded 4500 tons. There are few pending inquiries and only two of any size. The Davies & Thomas Co., New York, which has a contract to supply cast iron segments for the Fifty-seventh Street tunnel under the East River, New York, is sounding the market for 1000 tons of special iron for delivery at Catasauqua, Pa. Abendroth Brothers, Port Chester, N. Y., are inquiring for 150 tons of 3.25 to 3.75 per cent silicon foundry for prompt shipment. The Newport News Shipbuilding & Dry Dock Co. has not yet closed on 600 tons of foundry and malleable for delivery from June until October at Newport, News, Va. The American Locomotive Co. has placed 600 tons of high manganese iron for its Schenectady, N. Y., plant. An inquiry from the Richmond Radiator Co. for 2000 tons of foundry iron for delivery at Uniontown, Pa., is still pending. The price situation shows little change. Little foreign pig iron is being sold in this district, although a sale of 2000 tons of Dutch iron was recently made to a consumer in the Philadelphia district. No. 1X and lower grades of Dutch foundry are quoted at a common price of $22.50, duty paid port of entry. Melters are showing little interest in their third quarter requirements.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25 (all rail)	$22.41
No. 2 plain fdy. (by barge, del'd alongside in lighterage limits N. Y. and Brooklyn)	$19.75 to 20.50
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	21.89 to 23.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.39 to 23.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	22.89 to 24.02
No. 2 Virginia fdy., sil. 1.75 to 2.25	27.04

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania, $5.54 from Virginia.

Reinforcing Bars.—Business during the past week has been quiet, but a number of jobs on which inquiries have been made are likely to be placed during the early part of June. Approximately 1000 tons of open-hearth bars have been bought by a contractor from a German mill for subway construction in New York. Prices are unchanged.

Prices per lb. on billet steel reinforcing bars: From mill, 1.90c., Pittsburgh. Out of New York warehouse, 3.15c., delivered at job. Out of Youngstown warehouse, 2.50c., Youngstown, or 2.87½c., delivered New York.

Ferroalloys.—All British producers and at least one domestic producer, as well as the company making ferromanganese in electric furnaces abroad, reduced their quotations Wednesday, May 25, to $90, seaboard basis. It is understood that other producers are either out of the market or will not meet that level. Sales in the week have not been more than 400 to 500 tons, made up of mostly small lots and carloads for early delivery. Most consumers who contracted at higher levels are protected against a decline in price. The spiegeleisen market is also quite dull with sales and inquiries confined to carload and small lots which are selling at $36 to $37, Hazzard, Pa., basis. For desirable tonnages, probably $35 could be done. Specifications on contract for all major ferroalloys are reported satisfactory.

Finished Material.—With a stiffening of prices on some products and a gradual tapering in demand for others, May was brought to a close without the rather heavy buying which has characterized the last weeks of the previous months of this year. New business, however, while falling short of April in most cases, was equal to or greater than that in May of last year, and there are no indications of any pronounced slackening in June. Labor troubles in the metropolitan territory have not resulted in any serious falling off in demand for pipe and other building supplies. Sales of sheets and strips at the prices established at the beginning of the month are becoming more numerous and 3c., 3.85c., and 2.25c., Pittsburgh, on black, galvanized and blue annealed sheets, respectively, may now be said to represent the market in this territory. Hot-rolled strip is being held at 2.10c. to 2.30c., Pittsburgh and Cleveland, and sales of cold-rolled strip at less than 3c., Pittsburgh, have practically disappeared. Some of the mills have opened their books for third quarter at these prices, but no contracts are reported closed, such sales as have been made being for immediate delivery. On bars the range of prices is 1.80c. to 1.90c., Pittsburgh, with most business going at 1.85c. or lower. The market on plates is also somewhat weaker, and it is often difficult to get 1.85c., Pittsburgh, especially when the job contains a tonnage of shapes. Structural material is quotable at concessions of $2 to $3 a ton from the generally named price of 1.90c., Pittsburgh. A bank and an athletic club in Manhattan, requiring 6000 tons each, have

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard	5.75c.
Hoops	4.45c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terne sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	50 to 50 and 10
1 x 30 in. and smaller	45 to 50
Carriage bolts, cut thread:	
½ x 6 in. and smaller	50 and 10 to 60
¾ x 20 in. and smaller	50 to 50 and 5
Coach screws:	
½ x 6 in. and smaller	50 and 10 to 60
1 x 16 in. and smaller	50 to 50 and 5
Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in	$17.33
Seamless steel, 2-in	20.24
Charcoal iron, 2-in	25.00
Charcoal iron, 4-in	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
⅜-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	4	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	4.00c.
No. 22	4.15c.
No. 24	4.20c.
No. 26	4.30c.
No. 28*	4.45c.
No. 30	4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c. to 4.60c.
No. 16	4.45c. to 4.70c.
No. 18	4.60c.
No. 20	4.75c.
No. 22	4.80c.
No. 24	4.95c.
No. 26	5.20c.
No. 28*	5.45c.
No. 30	5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

been let in the last week. There has been little change in the demand for wire products.

Mill prices per lb. delivered New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.14c. to 2.24c.; structural shapes, 2.09c. to 2.24c.; bar iron, 2.14c.

Cast Iron Pipe.—Most makers are fairly well booked with business in the smaller sizes. Current buying is light, being largely composed of small lots to complete contracts. Prices are still irregular, although most of the Southern foundries are apparently adhering rather closely to the $37, base Birmingham. The Department of Water Supply, Gas and Electricity, New York, opened bids last week on about 200 tons of small-sized pipe, on which the United States Cast Iron Pipe & Foundry Co. was low bidder. Among export inquiries the 1500 tons of water pipe for Baranquilla, Colombia, is still open, and in the domestic market in this district the 4000 tons of pipe for Rochester, N. Y., inquired for by the J. G. White Engineering Co. is still pending, legal difficulties over the right-of-way having delayed execution of the contract.

Prices per net ton, delivered New York: Water pipe, 6-in. and larger, $45.60 to $47.60; 4-in. and 5-in., $50.60 to $52.60; 3-in., $60.60 to $62.60; Class A and gas pipe, $5 extra.

Warehouse Business.—The past month was quite active, comparing favorably with March and reported by some jobbers as the best month thus far this year. Demand for black and galvanized sheets continues steady, and prices are fairly firm, except for occasional concessions. Structural material is moving in good volume, although purchases are generally limited to 1 or 2 tons. Here, also, there is a tendency to offer slight reductions on desirable business. On bolts and screws an additional 5 per cent off list is offered by some sellers, the added discount generally applying on small current orders from the larger consumers.

Old Material.—The tendency of prices is still downward on many grades. No. 1 heavy melting steel continues to be purchased at $13.50 to $14 per ton, delivered eastern Pennsylvania. Shipments of heavy melting steel, yard, are going forward to consumers at Pottsville and Harrisburg, Pa., with brokers paying from $11.25 to $11.50 per ton, delivered. Heavy breakable cast is being bought at $15.50 per ton, delivered to consumers in Florence, N. J., Coatesville, Pa., and Claymont, Del. Locomotive grate bars are quoted at $11.75 to $12 per ton, delivered Phillipsburg, N. J. Borings and turnings are unchanged at $10.50 per ton, delivered eastern Pennsylvania. Machine shop turnings range from $9.50 to $10.50 per ton, delivered. One consumer in eastern Pennsylvania is offering to make further purchases of turnings at $9.50 per ton, delivered, which would necessitate brokers' buying at $9 per ton. This is apparently too low to interest the sellers, who seem to doubt that much tonnage could be secured at such a price.

Dealers buying prices per gross ton, New York:

No. 1 heavy melting steel	$10.00 to $11.35
Heavy melting steel (yard)	7.50 to 7.75
No. 1 heavy breakable cast	12.00 to 12.50
Stove plate (steel works)	7.50 to 8.50
Locomotive grate bars	9.00 to 9.50
Machine shop turnings	6.75 to 7.75
Cast borings (blast furnace or steel works)	7.25 to 7.75
Mixed borings and turnings	7.00 to 7.75
Steel car axles	15.75 to 16.25
Iron car axles	23.00 to 23.50
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.75 to 9.25
Forge fire (nom.)	7.75 to 8.25
No. 1 railroad wrought	12.00 to 12.50
No. 1 yard wrought, long	11.00 to 11.50
Rails for rolling	11.50 to 12.00
Cast iron carwheels	11.00 to 11.50
Stove plate (foundry)	9.75 to 10.00
Malleable cast (railroad)	11.00 to 11.50
Cast borings (chemical)	12.50 to 13.50
Prices per gross ton, delivered local foundries:	
No. 1 machinery cast	$15.00 to $15.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	13.50 to 14.00
No. 2 cast (radiators, cast boilers, etc.)	12.50 to 13.00

Coke.—Renewal of contracts for last half continues, with prices of foundry grade fairly stable at $5.35 per net ton, Connellsville, for shipment in open cars and at $5.60 for delivery in box cars. It is estimated that more than 100,000 tons of beehive and by-product coke has been contracted for recently in this district. Connellsville foundry coke for spot shipment shows a tendency toward weakness, and the current market is not quotable at better than $4.25 to $4.75 per net ton, Connellsville. Furnace grade is quiet at $3.25 to $3.50 for prompt shipment and at $3.75 on contracts. Delivered prices of Connellsville foundry coke are: To northern New Jersey, $8.28 to $8.78; New York or Brooklyn, $9.04 to $9.54; Newark or Jersey City, N. J., $8.16 to $8.66 per ton. By-product foundry coke continues at $9.59 to $10.77 per net ton, delivered Newark or Jersey City, N. J.

Cleveland

Bars, Plates and Shapes Easier—Third Quarter Sales of Pig Iron

CLEVELAND, May 31.—Orders for finished steel show a further decline, and the May volume with some of the mills was about 25 per cent below that of April. Business with some of the manufacturing industries has slowed down, and consumers are ordering material very closely. A rather quiet market is looked for during the next two months.

The market shows an easier price tone on steel bars, plates and structural material, on which 1.85c., Pittsburgh, has become a more common quotation. The automotive industry is delaying the buying of steel for the third quarter, but some activity in that direction is expected during the next week or two and this will bring a price test on some of the mill products. While the production of cheaper automobiles is holding up well, some of the makers of the higher-priced cars have curtailed production, and this is reflected in the decreased activity of some of the parts makers. Interest in this field is now centered on the time when the Ford Motor Co. will get under production with its new model, but as yet the date appears uncertain.

In the structural field an inquiry came out during the week for a warehouse for the May Co., Cleveland, requiring 3000 tons of structural steel and reinforcing bars. Bids for 2000 tons for the Prospect Avenue bridge were rejected, and new bids will be taken. Six steel barges for the New York State Barge Canal have been placed with the Marine Iron & Shipbuilding Co., Duluth.

Outside mills quote steel bars, plates and structural material at 1.85c. to 1.90c., Pittsburgh. The local mill price ranges from 1.85c. to 1.90c., Cleveland.

Pig Iron.—There was an increase in sales and inquiries in the past week, during which Cleveland interests sold 20,000 tons, mostly for the third quarter. Aside from inquiries aggregating a fair amount, a considerable number of consumers are sounding out the market on third quarter prices and are offering business at figures lower than those now prevailing. Producers look for an active third quarter buying movement shortly, although sales for that delivery are not expected to equal those for the second quarter, because considerable iron will be carried over and there has been a slowing down in foundry operations. Some producers are showing eagerness for third quarter business, and this has resulted in a weaker situation in some sections. While $18 to $18.50 are the ruling quotations by Cleveland furnaces for foundry and malleable iron for outside shipment, the lower price is now being shaded for delivery to competitive points, particularly in southern Ohio, and conditions point to a highly competitive market for the third quarter. The advance in pig iron freight rates recently authorized

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.75c. to 3.00c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-rolled strip	*5.95c.
Black sheets (No. 24)	3.65c.
Galvanized sheets (No. 24)	4.50c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb	$2.90
No. 9 galvanized wire, per 100 lb	3.35
Common wire nails, base, per keg	2.90

*Net base, including boxing and cutting to length.

by the Interstate Commerce Commission became effective this week, and with the new rates Cleveland furnaces must absorb more freight charges than heretofore to take business in Indiana. In Michigan $19, furnace, has become the common price for foundry and malleable iron, or a reduction of 50c. from the price that has prevailed for some time. There is little activity in the northern Ohio territory, although one consumer bought 800 tons during the week. Inquiries in this territory include one for 1500 tons of foundry and one for 800 tons of malleable iron.

Prices per gross ton at Cleveland:

N th'n No. 2 fdy., sil. 1.75 to 2.25.	$19.50
Southern fdy., sil. 1.75 to 2.25...	24.00
Malleable	19.50
Ohio silvery, 8 per cent.....	31.50
Basic, Valley furnace.....	18.00
Standard low phos., Valley fur..$27.50 to	28.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Iron Ore.—One sale of 100,000 tons was made during the week, and another buyer is understood to have closed for quite a tonnage. With this business disposed of, the early requirements of furnaces appear to have been well taken care of and little activity is expected during the next few weeks.

Ferromanganese.—The $5 a ton reduction to $90 on foreign and domestic ferromanganese has led to some market activity. Several consumers have covered for the last half, and existing contracts have been rewritten on the new basis. A few mills are still holding off, as they are uncertain as to what their requirements will be.

Coke.—Standard Connellsville foundry coke in grades on which the ruling current price is $4.50, ovens, is now being offered at that price for the last half, and premium brands for the same delivery are quoted at $5 to $5.35, ovens. A fair number of contracts are being placed.

Bolts and Nuts.—The volume of business in May declined somewhat from that in April. This was due in part to the fact that in the previous month consumers and jobbers took out considerable tonnage on first quarter contracts. Current orders are rather light. Some of the manufacturers have reduced production, and it is estimated that the industry is now operating at 55 to 60 per cent of capacity. The regular discount is being maintained.

Semi-Finished Steel.—Specifications have fallen off, and a local mill has curtailed production. Consumers as yet are showing no interest in buying for the third quarter, and there is little talk of prices for that delivery.

Sheets.—New demand is light and limited to early needs. Some business was placed during the week by Michigan automobile manufacturers to fill out their June requirements, but consumers generally are deferring buying for the third quarter and a real test of the market will not develop until round-lot business is placed for that delivery. While price concessions of $2 a ton are still appearing, these are for early shipment orders. For the third quarter mills appear to be holding firmly to 3c., Pittsburgh, for black, 2.25c. for blue annealed and 3.85c. for galvanized.

Strip Steel.—Some of the mills have opened their books for both hot and cold-rolled strip for the third quarter at present quoted prices, but consumers are showing no interest in placing contracts. Specifications on old contracts at the lower prices are only fair.

Reinforcing Bars.—A contract has been placed for 2000 tons for a Cleveland warehouse, which is understood to have been made at 1.95c., delivered on the job, with extras, except size extras waived. New inquiries include one for 2000 tons for another Cleveland warehouse. On rail steel bars 1.70c. is the common quotation on fair-sized lots.

Warehouse Business.—Jobbers are getting about the usual number of orders, but they are small in size and the May volume will show a falling off as compared with April. Prices are firm.

Old Material.—A Youngstown district mill has purchased a round tonnage of No. 2 heavy melting steel and compressed sheet steel at $14.50. For shipment against that purchase and for other Youngstown district orders, dealers are paying $14.50 to $15 for No. 1 heavy melting steel and $14 to $14.25 for No. 2 and compressed sheet steel. There is a limited local demand for No. 2 steel, for which dealers are paying $13.25, delivered, and for blast furnace scrap, which is bringing $10.25 to $10.50. Prices are no lower, but the recent buying in the Cleveland and Valley districts has not tended to strengthen the market.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.50 to $13.75
No. 2 heavy melting steel	13.00 to 13.25
Compressed sheet steel	13.00 to 13.25
Light bundled sheet stampings	11.50 to 12.00
Drop forge flashings	12.50 to 13.00
Machine shop turnings	9.00 to 9.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.75 to 14.00
No. 1 busheling	11.50 to 11.75
Pipes and flues	10.00 to 10.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.00 to 16.50
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	10.25 to 10.50
Mixed borings and short turnings	10.25 to 10.50
No. 2 busheling	10.25 to 10.50
Cupola Grades	
No. 1 cast	16.50 to 17.00
Railroad grate bars	12.00 to 12.50
Stove plate	12.00 to 12.50
Rails under 3 ft	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.50 to 16.00
Rails for rolling	16.25 to 16.50

Philadelphia

Steel Orders in May Held Fairly Close to the April Volume

PHILADELPHIA, May 31.—Eastern mills report that the volume of steel business in May held fairly close to the amount taken in April. There was a slight falling off in some lines, but on the whole the month did not bring the decline which had been expected in some quarters. There is practically nothing in the way of outstanding tonnage, but the day-to-day orders, though small individually, are fairly large in the aggregate. Eastern plate mills are operating at not more than 50 to 60 per cent, but in other products, notably structural shapes and sheets, the operation is more nearly 75 or 80 per cent.

Insistence of buyers on quick deliveries is becoming even more of a problem to the mills. Whereas two or three weeks was usually considered a good delivery on some items, a week's delivery is frequently demanded, and orders are as often placed on the basis of delivery promises as on the question of price. Some mills make a specialty of shipments from stock or immediate rollings, and other mills are compelled to

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.80c. to 3.00c.
Plates, ⅜-in.	3.00c. to 3.20c.
Structural shapes	2.65c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands)	2.70c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	3.85c. to 4.15c.
Steel bands, No. 12 gage to ⅜-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24)	4.35c.
Galvanized sheets (No. 24)	5.20c.
Blue annealed sheets (No. 10)	3.30c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

accept the situation or lose business even from regular customers.

Pig Iron.—The pig iron situation again strongly favors the buyer, though prices are holding. Stocks of iron on furnace yards are larger and the melt of iron is decreasing, both factors tending to make producers of iron more aggressive sellers. Except for second quarter contracts that will carry over, not a great deal of iron has been sold for third quarter, nor is there any indication of any buying movement in the making. Sales within the past week have amounted to only a few thousand tons, mostly foundry grades. Furnaces continue to quote $21, furnace, for No. 2 plain, the base grade, and there has been no business of sufficient attractiveness to test that price.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$21.76 to $22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X	22.76 to 23.26
Basic (delivered eastern Pa.)	20.75 to 21.25
Gray forge	21.00 to 21.50
Malleable	22.50 to 23.00
Standard low phos. (f.o.b. New York State furnace)	25.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 26.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	26.67
Virginia No. 2X, 2.25 to 2.75 sil.	27.17

Prices, except on low phosphorus, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $5.17 from Virginia furnaces.

Ferromanganese.—The further reduction on English ferromanganese to $90, seaboard, announced last week, has forced domestic producers to revise their contracts to that basis, which is declared to be below cost of production. A few small contracts for second half have been written at the new price.

Plates.—Further weakness has appeared in the plate market. More sales are being made at 1.80c. and 1.85c., Pittsburgh, and only small lots are being sold at 1.90c., the figure at which the market held for many months. Business is in lighter volume, Eastern mills operating at about 50 per cent.

Structural Shapes.—Competition for business is keener in view of the dropping off in the volume of tonnage. On ordinary lots the quotations of Eastern mills are usually 1.80c. and 1.85c., Pittsburgh, but larger lots bring out concessions of $1 or $2 a ton. The largest fabricated steel award is 2300 tons for a textile machinery plant at Reading, Pa.

Bars.—Small-lot orders predominate in bars. Quotations are quite uniformly on the basis of 1.85c., Pittsburgh, except to large distributers, such as concrete bar companies. Bar iron is quoted by Eastern makers at 2.12c., Philadelphia.

Sheets.—On such new business as is being placed the new sheet prices are being held to firmly. However, most consumers are still protected at the old prices, and unspecified tonnage on these contracts will in many instances carry them through June. A few irregularities are reported, but when run down turn out to be similar to an order at 2.90c., Pittsburgh, for black sheets taken by a jobber from a consumer and applied against the jobber's contract price of 2.75c.

Imports.—Pig iron imports last week reached a total of 3750 tons, of which 3500 tons came from England and 250 tons from Germany. Other imports were as follows: Bars from Sweden, 109 tons; bars from Belgium, 108 tons; plates from France, 10 tons; structural shapes from France, 5 tons, from Belgium, 631 tons and from Germany, 47 tons; chrome ore from Portuguese Africa, 3250 tons; manganese ore from British India, 1500 tons, from British West Africa, 6437 tons.

Old Material.—Aside from further weakness in machine shop turnings and bundled sheets for steel works use, there has been no change of importance in the scrap market. A leading consumer of these grades is now offering $9.50, delivered, but its recent purchases were at $10. One of the principal consumers of cast iron borings for open-hearth use is no longer taking them, and they will probably be shipped to blast furnaces, thereby reducing the return that shippers will get for them.

Prices per gross ton, delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$14.00 to $14.50
Scrap T rails	13.50 to 14.00
No. 2 heavy melting steel	12.00 to 13.00
No. 1 railroad wrought	16.50 to 17.00
Bundled sheets (for steel works)	10.00 to 10.50
Machine shop turnings (for steel works)	10.00 to 10.50
Heavy axle turnings (or equivalent)	12.50 to 13.00
Cast borings (for steel works and rolling mill)	11.50 to 12.00
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	11.50 to 12.00
Stove plate (for steel works)	11.50 to 12.00
No. 1 low phos., heavy, 0.04 per cent and under	18.00 to 18.50
Couplers and knuckles	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
No. 1 blast furnace scrap	10.50
Machine shop turnings (for rolling mill)	10.50 to 11.00
Wrought iron and soft steel pipes and tubes (new specifications)	13.00 to 13.50
Shafting	18.00 to 19.00
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00 to 11.50
Steel rails for rolling	16.00 to 16.50
Cast iron carwheels	16.00 to 16.50
No. 1 cast	16.50 to 17.00
Cast borings (for chemical plant)	15.00 to 16.00

MANY IMMIGRANTS COME IN

Over 118,000 in Quota List in Nine Months—3691 Metal Workers Enter; 551 Depart

WASHINGTON, May 25.—Iron and steel workers coming to the United States as immigrants in March numbered 206 and for the nine months ended with March 1757, compared with 27 who departed in March and 142 who emigrated during the nine months. Machinists coming to the United States in March and the nine-month period numbered 187 and 1546, respectively, and the machinists departing were 25 and 376, respectively. Metal workers other than iron and steel coming to the United States in March and the nine-month period were 31 and 388, respectively, while the number of emigrants in this class were two and 33.

There were 46,238 aliens admitted to the United States in March, the number of immigrants for permanent residence being 29,868, against 29,504 in March, 1926. During the nine months ended March 31, a total of 118,692 aliens of the quota immigrant class were admitted to the United States, or 72.1 per cent of the annual quota of 164,667. This compares with 112,889 aliens of the same class, or 68.1 per cent of the yearly quota, admitted during a like period of the preceding fiscal year 1925-26. Greece, Latvia and Luxemburg exhausted their annual quotas during March. The principal European sources from which immigration was drawn during March were: Germany, 4546; Irish Free State, 2295; Italy, 1600; Scotland, 1098; Norway, 959; Sweden, 946; Poland, 941, and England, 852.

Less Steel Furniture Produced

Shipments of steel furniture in April are reported by the Department of Commerce from 33 manufacturers at $2,849,536, a considerable drop from the March figure of $3,080,931. The total was higher, however, than that for April a year ago at $2,782,167, and, with the exception of March and of last December, was the highest total since January, 1926. New orders meantime dropped to $2,750,877 in April from $3,021,915 in March. The current figure was the lowest since last November and compares with $2,936,884 in April last year. Unfilled orders at the end of April were $1,645,599, or the smallest since the end of December.

In the steel shelving group, 15 companies reported shipments in April of $677,745, compared with $690,783 in March. Except for March the current figure is higher than any since April a year ago, when a total of $699,370 was reported. New orders at $621,888 were the smallest since January, while unfilled orders at the end of April were $627,266, or about one month's shipments at current rate.

Boston

Pig Iron Sales Show Slight Gain—Coke Prices Unchanged for June

BOSTON, May 31.—Largely because of the activities of the Mystic Iron Works, which booked upwards of 4000 tons, pig iron sales in this territory in the past week showed a slight increase. An eastern Massachusetts melter bought 200 tons of No. 2X and 100 tons of No. 1X for second quarter delivery and 400 tons of No. 2X and 200 tons of No. 1X for third quarter, a total of 900 tons, but the bulk of transactions was made up of smaller tonnages for third quarter delivery. Competition among furnaces east of Buffalo for business in this territory continues keen. To points taking freight rates of about $2 a ton the Mystic Iron Works has not quoted less than $20, furnace. When the freight is higher, that furnace is meeting the competition of other producers east of Buffalo. The differential between No. 2 plain and No. 2X iron is ordinarily waived. Buffalo furnaces cannot compete at these prices, but for mixture purposes No. 2X Buffalo iron has been taken at $18.50 a ton, furnace, or around $23.41, delivered, and full prices have been obtained for western Pennsylvania and Alabama irons. Other irons, including foreign, are quoted at premiums over the prices quoted by producers east of Buffalo. It now develops that the recent sale of fourth quarter iron reported last week was an unusual transaction and that furnaces are not soliciting business for that period. Foundries are taking contract iron a little more freely, some of them anticipating shipments.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$22.41 to $22.91
Buffalo, sil. 2.25 to 2.75	22.91 to 23.41
East. Penn., sil. 1.75 to 2.25	24.15 to 24.65
East. Penn., sil. 2.25 to 2.75	24.65 to 25.15
Virginia, sil. 1.75 to 2.25	27.42
Virginia, sil. 2.25 to 2.75	27.92
Alabama, sil. 1.75 to 2.25	24.91 to 26.77
Alabama, sil. 2.25 to 2.75	25.41 to 27.27

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.92 from Virginia, $6.91 to $8.77 from Alabama.

Coke.—Both the New England Coal & Coke Co. and the Providence Gas Co. announce that contract by-product foundry coke for June delivery within a $3.10 freight rate zone will be billed at $12 a ton, the same price that ruled for May. The movement of fuel from ovens to foundries is increasing, owing to the fact that reserve stocks at foundries are getting down to small proportions and the melt of iron is gradually increasing. Between 90 and 95 per cent of the New England foundries have renewed their contracts with the Everett, Mass., and Providence, R. I., ovens to cover last half requirements. Connellsville district foundry coke is still available at delivered prices well under those on New England fuel, but demand is slack.

Cast Iron Pipe.—The outstanding feature of the pipe market is the volume of business placed privately. One company has booked approximately 3000 tons of gas pipe from a Massachusetts company, as well as several smaller lots, bringing its private bookings for May up to about 10,000 tons. Other pipe foundries also report a good private business. On open bids, R. D. Wood & Co. has taken a contract for 200 tons of 6 and 8-in. pipe for Fall River, Mass. Revere, Mass., rejected bids on 275 tons of 12-in. pipe submitted early in May, and took new figures May 27, on 800 tons of 6 to 14-in., including the 275 tons of 12-in. On June 3, the Metropolitan District Water Commission will close bids on 14,000 ft. of 24-in. pipe. Reading, Mass., is in the market for a comparatively small tonnage of small pipe. Although foundries are fairly well sold ahead, competition for business continues active and prices on large pipe remain unsettled, while no effort is being made to secure higher prices for small sizes. Prices quoted openly on domestic pipe are: 4-in., $58.10 a ton, delivered common Boston freight rate points; 6 to 12-in., $53.10 to $54.10; larger pipe, $52.10 to $53.10. A $5 differential is asked on Class A and gas pipe.

Old Material.—With the exception of scrap rails and mixed borings and turnings, which are weaker, old material prices are practically unchanged, but the undertone of the market is still unsettled and business is confined largely to stray cars of miscellaneous scrap. Yard steel apparently is the most active material, with the bulk of current sales bringing around $7 to $7.50 a ton, on cars shipping point. A Massachusetts horseshoe maker is buying some railroad wrought, and a Bridgeport, Conn., plant, stove plate. Otherwise, most of the material being moved is to points outside of New England. Textile machinery cast is freely offered at $14, on cars shipping point, which brings the delivered price up to around $16.50 to $17. Brokers, however, cannot sell at that price, and consequently the market is nominal on the basis of the last previous sales. One New England buyer of shafting is now using billets, leaving the market for shafting narrower than ever.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$9.00 to $9.50
Scrap rails	8.50 to 9.00
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought	10.00 to 10.25
Machine shop turnings	5.00 to 5.50
Cast iron borings (steel works and rolling mill)	6.50 to 7.00
Bundled skeleton, long	5.50 to 6.00
Forged flashings	5.50 to 6.00
Blast furnace borings and turnings	5.00 to 5.50
Forged scrap	6.20 to 7.00
Shafting	14.00 to 14.50
Street car axles	15.00 to 15.50
Wrought pipe (1 in. in diameter, over 2 ft. long)	8.00 to 8.50
Rails for rerolling	11.00 to 11.50
Cast iron borings, chemical	10.50 to 11.00
Prices per gross ton, delivered consumers' yards:	
Textile cast	$14.50 to $15.00
No. 1 machinery cast	14.50 to 15.00
No. 2 machinery cast	12.50 to 13.00
Stove plate	11.50 to 12.00
Railroad malleable	15.00 to 15.50

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

Birmingham

Two Blast Furnaces Put Out—Steel Production Declining

BIRMINGHAM, May 31.—In the pig iron market small-lot buying is still the rule and prices are holding at $18, Birmingham, for No. 2 foundry grade. Two blast furnaces, one of them on basic, are being blown out. Independent producers of foundry iron, however, are operating at an unchanged rate and do not contemplate any curtailment of output in the near future. Shipments are going forward from furnaces in good volume, but sales are tapering. Although a few melters are showing interest in their requirements for third quarter, no sales for that period have been reported.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil.	$18.00
No. 1 foundry, 2.25 to 2.75 sil.	18.50
Basic	18.00
Charcoal, warm blast	29.00

Rolled Steel.—Several open-hearth furnaces are idle, and the operations of some of the steel-consuming industries have receded. Fabricating shops in this district, however, are doing fairly well, having several large contracts to fill. There is a steady movement of finished steel by sea-going barges to the Southwest, particularly to Port Arthur, Houston and Beaumont.

Tex. Mill prices are substantially unchanged. Although total steel output has declined, there has been an increase in the production of the lighter forms of finished steel during the past month.

Cast Iron Pipe.—Output of pressure pipe is being maintained at a steady rate, although fresh lettings are coming in slowly. Quotations are weak at $36 to $37 per net ton, Birmingham, on 6-in. and larger diameters. Shipments are moving largely to the Northwest, Southwest and Far West. Buying of soil pipe and fittings is lagging, but production is being held down to the level of demand.

Coke.—Independent coke operators are reducing operations in conformity with the decline in demand. The recession in output, however, has been smaller than is usually the case at this season. Prices on by-product foundry coke remain unchanged at $5.50 per net ton, Birmingham, while beehive coke is still commanding $6.

Old Material.—Users of heavy melting steel are pressing for lower prices, and on a few sales concessions are reported to have been made. On the whole, however, scrap prices are substantially unchanged. The supply of old material is ample, and with transportation good, dealers have no difficulty in filling orders. Heavy melting and No. 1 cast remain the most active grades on the list.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	$12.00 to $12.25
Scrap steel rails	12.50 to 13.00
Short shoveling turnings	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Stove plate	13.00 to 14.00
Steel axles	16.00 to 17.00
Iron axles	16.00 to 17.00
No. 1 railroad wrought	11.00 to 12.00
Rails for rolling	13.00 to 14.00
No. 1 cast	15.00 to 16.00
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.00 to 13.50

St. Louis

Texas Scrap Moving to Japan and Italy—Sheet Demand Improves

ST. LOUIS, May 31.—Absence of inquiries for third quarter pig iron and a sustained flow of small scattered orders for June delivery point to a continuation of the hand-to-mouth buying policy that has prevailed for some time. Melters hardly know at the beginning of the month what their books will show at the month's end, and a similar situation obtains among their customers. Prices are unchanged. Sales of the St. Louis Coke & Iron Corporation for the week amounted to only about 1500 tons.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$20.50 to $21.00
Northern No. 2 fdy., delivered St. Louis	22.16
Southern No. 2 fdy., delivered	22.42
Northern malleable, delivered	22.16
Northern basic, delivered	22.16

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—The market is quiet. Only a fair business is being done in foundry grades. Users of domestic fuel are drawing from the piles accumulated weeks ago in anticipation of the coal strike and business in this grade is dull.

Finished Iron and Steel.—The local sheet maker reports that within the last two weeks there has been an increasing number of orders for galvanized sheets from the Southern flood sections, with the prospects for a steadily increasing volume from that territory. The market for sheets is firm, and the recent advances are holding up well. With curtailment the order of the day in the oil fields, there has been a slump in the demand for plates. Warehouse business is quiet.

Old Material.—Reports here are that heavy accumulations of old material throughout Texas are being absorbed for export to Japan and Italy at prices in some instances $1.50 per ton higher than could be realized by shipping to St. Louis, where most of this material is ordinarily sold. This is regarded as helpful to the situation here, which has been weakened by lack of buying by consumers and heavy offerings by railroads. Miscellaneous rails and steel angle bars are each off 25c. a ton; otherwise appended prices are unchanged. Railroad lists include: Pennsylvania Railroad, 45,000 tons; Chicago, Milwaukee & St. Paul, 8100 tons; Chicago, Burlington & Quincy, 7300 tons; Missouri Pacific, 5000 tons; Big Four lines, 4200 tons; Union Pacific, 300 tons; Nickel Plate, 1500 tons, and St. Louis-San Francisco, 300 tons.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	$11.50 to $12.00
No. 1 locomotive tires	14.25 to 14.75
Heavy shoveling steel	11.50 to 12.00
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	12.50 to 13.00
Railroad springs	13.50 to 14.00
Bundled sheets	8.50 to 9.00
No. 2 railroad wrought	11.50 to 12.00
No. 1 busheling	10.00 to 10.50
Cast iron borings	9.00 to 9.50
Iron rails	14.00 to 14.50
Rails for rolling	14.00 to 14.50
Machine shop turnings	6.75 to 7.25
Steel car axles	19.00 to 19.50
Iron car axles	23.00 to 23.50
Wrought iron bars and transoms	19.50 to 20.00
No. 1 railroad wrought	12.00 to 12.50
Steel rails, less than 3 ft	15.50 to 16.00
Steel angle bars	11.75 to 12.25
Cast iron carwheels	14.00 to 14.50
No. 1 machinery cast	17.50 to 18.00
Railroad malleable	12.50 to 13.00
No. 1 railroad cast	15.00 to 15.50
Agricultural malleable	13.00 to 13.50
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.80c.
Galvanized sheets (No. 24)	5.35c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.60c.
Boiler rivets	3.80c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller	70
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, square, blank or tapped	60
Hot-pressed nuts, hexagons, blank or tapped	60

Toronto

Pig Iron Sales Show 10 Per Cent Gain Over Last Year

TORONTO, ONT., May 31.—Confidence in the iron and steel business as a whole has been inspired by the steady demand for foundry and malleable pig iron in the Canadian markets. Local blast furnace representatives report good sales on spot account and an improvement in inquiries for third quarter. Orders for immediate delivery range from 50 to 200 tons each, with melters entering the market in larger number and at more frequent intervals. It is estimated by producers that sales so far this year have been at least 10 per cent heavier than those for the corresponding period of last year, while last year's sales were decidedly better than those for the year previous. It is now reported that Canada will cancel trade relations with the Russian Soviet Government, following the example set by Great Britain, but according to Canadian manufacturers of various products who have been trading with Russia, this action will have no direct bearing on current business in the iron and steel industry.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$24.10
No. 2 foundry, sil. 1.75 to 2.25	24.10
Malleable	24.10
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	26.50
No. 2 foundry, sil. 1.75 to 2.25	26.50
Malleable	26.50
Basic	25.50
Imported Iron at Montreal Warehouse	
Summerlee	36.00
Carron	36.00

Old Material.—While sales for the week average close to those of the past week or two the holiday on Tuesday had a tendency to curtail business to some extent. Inquiries for both immediate and future delivery are improving and the general trend of business is on the upgrade. Melters are continually entering the market with new orders, which, in addition to releases against contracts, result in a brisk movement of scrap between dealers and consumers. Some contracts have been placed for third quarter by a few of the larger consumers, but the smaller buyers appear satisfied to buy as demands dictate. In the Montreal market some improvement has featured business of late, but this has not yet been so pronounced as that in the Ontario districts. Buying of a speculative nature is being carried on by dealers, but most of this is at bargain prices. Dealers are also buying old material for direct shipment to consumers but are adding little to yard holdings, which supplies are adequate for all present needs. Prices appear to be gaining strength, but business is still too limited to warrant a general revision.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$10.50	$9.00
Rails, scrap	11.00	10.00
No. 1 wrought	11.00	14.00
Machine shop turnings	8.00	7.50
Boiler plate	8.00	8.00
Heavy axle turnings	8.50	8.50
Cast borings	8.50	7.50
Steel turnings	8.00	8.00
Wrought pipe	6.00	6.00
Steel axles	15.00	17.00
Axles, wrought iron	17.00	19.00
Per Net Ton		
No 1 machinery cast	16.00	18.00
Stove plate	10.00	13.00
Standard carwheels	14.00	16.00
Malleable scrap	14.00	14.00

Buffalo

Good Volume of Pig Iron Buying for Third Quarter—Scrap Dull

BUFFALO, May 31.—Pig iron buying is in greater volume than it has been at any time so far this quarter, as a result of some large third quarter commitments by representative consumers. One inquiry of more than 3500 tons of foundry and a good quantity of malleable is reported to have been placed, and a number of smaller tonnages have been closed. On inquiry of this character it is believed that $18, base Buffalo, on foundry iron may have been shaded, but that price continues the ruling base for delivery in this district. Recent orders, most of which were for third quarter, have reduced pending inquiry to small proportions.

Prices per gross ton, f.o.b. Buffalo furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.50 to $18.00
No. 2X foundry, sil. 2.25 to 2.75	18.00 to 18.50
No. 1X foundry, sil. 2.75 to 3.25	19.00 to 19.50
Malleable, sil. up to 2.25	17.50 to 18.00
Basic	17.50 to 17.75
Lake Superior charcoal	27.28

Finished Iron and Steel.—The finished steel market shows little change from its recent status. Prices are steady, business is fair and operations are unchanged except for the curtailment that usually comes at a double holiday. Soft steel bars are bringing 1.90c., Pittsburgh, with occasional shading to 1.85c., base, on choice tonnage. A similar situation obtains in shapes. Reinforcing bars are holding at 1.90c., base Pittsburgh. Mill operations are estimated at 75 to 80 per cent of capacity.

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb	3.90

Old Material.—A lifeless scrap market was the rule in this district in the holiday period. Consumers have no tonnage inquiries before the trade, and transactions have been restricted to small lots. Prices show no change, as no new tonnage business has appeared to test the market.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$15.50 to $16.00
No. 2 heavy melting steel	14.50 to 15.00
Scrap rails	16.00 to 16.50
Hydraulic compressed sheets	14.50 to 15.00
Hand-bundled sheets	11.00 to 11.50
Drop forge flashings	13.00 to 13.50
No. 1 busheling	14.50 to 15.00
Heavy steel axle turnings	14.00 to 14.50
Machine shop turnings	9.00 to 9.50
Acid Open-Hearth Grades	
Railroad knuckles and couplers	17.50 to 18.00
Railroad coil and leaf springs	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
Low phosphorus billet and bloom ends	17.50 to 18.00
Electric Furnace Grades	
Heavy steel axle turnings	14.00 to 14.50
Short shoveling steel turnings	11.50 to 12.00
Blast Furnace Grades	
Short shoveling steel turnings	11.50 to 12.00
Short mixed borings and turnings	10.00 to 10.50
Cast iron borings	11.00 to 11.50
No. 2 busheling	13.50 to 14.00
Rolling Mill Grades	
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.00 to 13.50
Cupola Grades	
No. 1 machinery cast	16.50 to 17.00
Stove plate	14.00 to 14.50
Locomotive grate bars	13.00 to 13.50
Steel rails, 3 ft. and under	18.00 to 18.50
Cast iron carwheels	15.00 to 16.00
Malleable Grades	
Railroad	16.50 to 17.00
Agricultural	16.50 to 17.00
Industrial	16.50 to 17.00

San Francisco

Southern Pacific Buys 1000 Tons of Pig Iron—More Steel Imported

SAN FRANCISCO, May 28 (*By Air Mail*).—Notable among developments in a week of comparatively light buying have been the placing of 1000 tons of foundry pig iron by the Southern Pacific Co., San Francisco, an award of 3100 tons of reinforcing bars for the Glendale-Hyperion viaduct, Los Angeles, and the arrival at this port of 750 tons of Indian pig iron and 1105 tons of Belgian steel. Most of the steel tonnage is soft steel bars, although there is also about 500 tons of small structural shapes.

While individual inquiries in nearly all departments of the market continue fairly numerous, the quantities of materials called for are relatively small, and there is a definite hesitancy on the part of buyers in the matter of anticipating future requirements. The situation in regard to prices is unchanged.

Pig Iron.—A shipment of 750 tons of Indian foundry iron arrived during the week, and a similar amount is due in Los Angeles. The Southern Pacific Co., San Francisco, has closed on 1000 tons of foundry iron. Quotations are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Lettings in fabricated structural steel during the week totaled 1495 tons; fresh inquiry calls for about 400 tons. The largest individual award, 800

Warehouse Prices, f.o.b. San Francisco

Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Small angles, ⅞-in. and over	3.00c.
Small angles, under ⅞-in.	3.40c.
Small channels and tees, ¾-in. to 2¾-in.	3.60c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.70c.
Blue annealed sheets (No. 10)	3.75c.
Galvanized sheets (No. 24)	5.25c.
Common wire nails, base per keg	$3.75
Cement coated nails, 100-lb. keg	3.75

tons for a steel barge for the Southern Pacific Co., San Francisco, was taken by the Moore Dry Dock Co., Oakland, Cal. Eastern mills continue to quote plain material at 2.35c., c.i.f. Coast ports.

Plates.—Spokane, Wash., will take bids June 2 on 728 tons for a riveted steel pipe line. In Los Angeles, the Los Angeles County Flood Control District will take bids July 11 on its San Gabriel dam project, which will require 1157 tons of steel, of which 772 tons is for a riveted pipe line, 280 tons for gates and valves and 105 tons for trash racks. The district will furnish the steel. The largest individual letting of the week, 263 tons for a pipe line for Arcadia, Cal., was taken by the Western Pipe & Steel Co., San Francisco. Eastern mills continue to quote plates at 2.30c., c.i.f. Coast ports.

Bars.—Lettings in reinforcing bars total 4198 tons. The largest individual award, 3100 tons for the Glendale-Hyperion viaduct, Los Angeles, was placed with unnamed firms through Lange & Bergstrom, general contractors. The San Gabriel dam project in Los Angeles for the Los Angeles County Flood Control District will require 1200 tons, which the district will furnish. Drainage Improvement District No. 20, Los Angeles, will take bids June 13 on 500 tons. Locally, reinforcing bar jobbers' sales are confined to relatively small lots. Quotations are unchanged at 2.85c., base, per lb., on lots of 200 tons, and at 3.10c., base, on less-than-carload lots.

Cast Iron Pipe.—Larger lettings of the week include the following:

TACOMA, WASH., 236 tons, 6 to 16-in., Classes B and C, to an unnamed maker.

PHOENIX, ARIZ., 183 tons, 2 to 12-in. Class B, to an unnamed producer through Claude Fisher, general contractor.

FILLMORE, CAL., 117 tons, of which 96 tons of 4-in. Class B was placed with the Pacific States Cast Iron Pipe Co., Provo, Utah, and 21 tons of 10-in. Class B was awarded to the United States Cast Iron Pipe & Foundry Co.

ARCADIA, CAL., 878 tons, of which 341 tons of 4 and 10-in. Class B was taken by the American Cast Iron Pipe Co., 224 tons of 12-in. Class B was placed with the United States Cast Iron Pipe & Foundry Co. and 213 tons of 14-in. Class B went to the Grinnell Co. of the Pacific.

SAN DIEGO, CAL., 142 tons for street improvement work to unnamed interests.

Steel Pipe.—Long Beach, Cal., has awarded 1515 tons of 1¼ to 24-in. gas pipe to the Crane Co. and the American Wholesale Hardware Co., Long Beach. No fresh inquiries of importance have come into the market during the past week.

Warehouse Business.—While orders are fairly numerous, individual inquiries call for small lots. Quotations are unchanged.

Rivets.—The Southern Pacific Co., San Francisco, is taking bids on 100 tons of rivets. Eastern mills quote rivets at $2.75, base per 100 lb., Pittsburgh.

Coke.—The Southern Pacific Co. is inquiring for 500 tons and will open bids next week on both beehive and by-product fuel. Fresh imports from Europe are expected to arrive at this port early in June. Both English and German by-product coke are quoted at $11.50 to $12.50 per net ton at incoming dock. English beehive fuel is quoted at about $17. Importers' stocks are low, and local demand is active.

Scrap Prices Unchanged at Detroit

DETROIT, May 31.—There has been no change in the Detroit scrap market during the past week. The tonnage being offered by producers for delivery during the month of June is covered by orders on dealers' books or by numerous small sales. A few melters are inquiring for third quarter requirements on pig iron without any actual buying movement being developed. Prices are unchanged.

	Per Gross Ton
Heavy melting and shoveling steel	$12.50 to $13.00
Borings and short turnings	8.25 to 8.75
Long turnings	7.50 to 8.00
No. 1 machinery cast	17.00 to 18.00
Automobile cast	19.00 to 20.00
Hydraulic compressed	11.00 to 11.50
Stove plate	13.50 to 14.50
No. 1 busheling	10.50 to 11.00
Sheet clipping	8.00 to 8.50
Flashings	10.50 to 11.00

Cincinnati

Gain in Warehouse Sales of Steel—Heavy Melting Declines Again

CINCINNATI, May 31.—The pig iron market is practically stagnant. Buyers are showing no interest in third quarter tonnage, and indications are that no improvement can be expected before the latter part of June or possibly July. Since consumers have considerable iron on hand and have been slow in specifying against current contracts, some dealers are of the opinion that purchasing for third quarter will not attain extensive proportions. There has been relatively little change in prices. Northern Ohio furnaces are quoting $18, base Cleveland, for delivery into this territory and in some cases are dipping 25c. to 50c. a ton under that figure. Producers in the Ironton district are selling at from $19 to $19.50, base furnace. Southern iron is firm at $18, base Birmingham, but sales have been small. Jackson County silvery furnaces report that shipments have been holding up well, but that new business has been light. On May 31 there were four merchant and four steel plant furnaces in blast in the southern Ohio district.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89 to $21.39
So. Ohio malleable	20.64 to 21.89
Alabama fdy., sil. 1.75 to 2.25	21.69
Alabama fdy., sil. 2.25 to 2.75	22.19
Tennessee fdy., sil. 1.75 to 2.25	21.69
Southern Ohio silvery, 8 per cent	30.39

Freight rates: $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—In some respects May turned out to be disappointing to producers of finished steel. Orders did not come in so rapidly as many mills had anticipated, and specifications against second quarter contracts were below expectations. The steady demand for small tonnages for prompt delivery, however, has been well sustained. Conditions in the fabricating field are not altogether satisfactory. While some companies have as much as two months of work ahead of them, others have only enough to keep them occupied for about two weeks. The price situation also is regarded as unfavorable, many structural jobs having been awarded recently on the basis of extremely low quotations. The jobbing trade is absorbing only a limited amount of material and is watching inventories carefully to avoid over-stocking. No improvement is noted in the demand for wire goods. Sales have been confined to small lots for immediate shipment, and prices are showing weakness. Common wire nails are being sold at about $2.70 per keg, delivered at Cincinnati by barge. Plain wire is quoted at $2.40 per 100 lb., Pittsburgh or Ironton. Bookings of structural steel and bars have been of moderate volume, and prices are holding well at 1.90c., base Pittsburgh, except at Louisville, Ky., and Evansville, Ind., where competition between Pittsburgh and Chicago mills is severe. In the sheet market both producers and consumers are focusing attention upon the third quarter, although practically no buying for delivery beyond June 30 has been disclosed. Quotations are being maintained at the schedule which fixes blue annealed at 2.25c., base Pittsburgh, black at 3c. and galvanized at 3.85c. Sheet mills

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, soft steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 24)	3.60c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb.	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base per 100 lb. keg	2.95
Chain, per 100 lb.	7.55
	Net per 100 Ft.
Lap welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

in this district continue to operate at approximately 95 per cent of capacity.

Reinforcing Bars.—The Pollak Steel Co. will furnish 550 tons of bars for two local jobs, one being the new warehouse of the Cincinnati Wholesale Grocers Co. and the other the remodeling of Music Hall. Bids are being taken on 125 tons for the reconstruction of the Harrison Avenue viaduct, Cincinnati. New billet bars are quoted at 1.90c., base Pittsburgh, and rail steel bars at 1.80c., base mill, but sellers are making concessions of $1 a ton to secure attractive orders.

Warehouse Business.—Bookings in May were better than those during April, and jobbers are encouraged by the outlook for good business throughout the coming month. The improvement has been well distributed among almost all commodities, although structural steel and bars are unusually active. Prices have undergone no change.

Coke.—During June the present price of $9.52, delivered Cincinnati, on by-product foundry coke will be continued. On domestic egg, for which two companies are asking $5 a net ton, f.o.b. ovens, a third producer is soliciting business at $4.50. Quotations of $4.50 on walnut sizes, however, are being maintained by all sellers. The price structure in Michigan also will not be disturbed, by-product foundry holding at $9.50, Detroit ovens. Shipments of by-product foundry coke fell off between 10 and 15 per cent in May, but deliveries of domestic grades showed a corresponding increase. An inquiry for 600 tons of foundry coke is reported by a local dealer.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, $9.52 to $9.64; Wise County coke, $7.59 to $8.09; New River coke, $10.09 to $10.59. Freight rates: $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—Another reduction of 25c. a ton in heavy melting steel marks the third decrease in that item during the past month. A Portsmouth, Ohio, steel company is understood to be willing to pay $15, delivered, for a round tonnage, but dealers are holding out for 25c. a ton more. Foundry grades continue weak, and the market in general is dormant.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$11.75 to $12.25
Scrap rails for melting	12.75 to 13.25
Loose sheet clippings	8.50 to 9.00
Champion bundled sheets	9.50 to 10.00
Cast iron borings	8.75 to 9.25
Machine shop turnings	7.75 to 8.25
No. 1 busheling	9.50 to 10.00
No. 2 busheling	7.00 to 7.50
Rails for rolling	14.00 to 14.50
No. 1 locomotive tires	15.50 to 16.00
No. 1 railroad wrought	12.00 to 12.50
Short rails	17.50 to 18.00
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	17.50 to 18.50
No. 1 railroad cast	14.50 to 15.00
Burnt cast	8.50 to 9.00
Stove plate	10.00 to 10.50
Brake shoes	10.25 to 11.00
Railroad malleable	13.00 to 13.50
Agricultural malleable	12.50 to 13.00

Lewis Foundry & Machine Co. Under New Management

The Lewis Foundry & Machine Co., Groveton, Pa., has been bought by a group headed by Frank Cordes, who for the past five years has been manager of the chilled roll department of the Wheeling Mold & Foundry Co., Wheeling, W. Va., and the new owners, with Mr. Cordes as president, have assumed control.

The financial structure of the company has been changed as part of its transfer to new ownership, and consists of $750,000 6 per cent first-mortgage bonds, $250,000 of 7 per cent cumulative preferred stock of $100 par value and 25,000 shares of no par value common stock.

The company in 1920 built a 25-ton acid open-hearth furnace but has never operated it. Its foundry has an annual capacity of 12,000 tons of gray iron castings and chilled rolls.

Mr. Cordes has long been identified with the production and sale of rolling mills and rolls and before joining the Wheeling Mold & Foundry Co. in 1922, was president of the Hubbard Steel Foundry Co., Chicago, and before that had been vice-president of the United Engineering & Foundry Co., Pittsburgh.

Revive Mid-West Sheet Steel Merger

YOUNGSTOWN, May 31.—Efforts are being made to revive the mid-west independent sheet steel merger, which failed several months ago after frequent conferences had been held. These conferences have lately been renewed in an effort to arrive at an agreement, and some of the points of difference which formerly prevailed have been overcome. Seven companies were involved in the original consolidation plans, the largest of which was the Mansfield Sheet & Tin Plate Co., Mansfield, Ohio. The rest were located in northeastern Ohio.

Operations Irregular in the Valleys

YOUNGSTOWN, May 31.—Iron and steel production in the Mahoning and Shenango Valleys continues to exhibit irregular operating tendencies. There was virtually no curtailment at Youngstown because of Memorial Day observance. Strip mills are averaging 75 per cent and independent bar mills 65 per cent. Production and shipments during the second quarter by the Valley steel industry will be under the figures for the first three months of the year. March remains as the peak month of this year.

Buying Schedules That Aim at Zero Inventories

In THE IRON AGE of May 5, page 1286, reference was made to the remarks of Chapin Hoskins, managing editor of *Factory*, at the meeting of the production division of the American Management Association at Detroit. Our report did not correctly represent Mr. Hoskins's position on the practicability of a purchasing system in industry that will virtually do away with stocks of raw materials. A paper by Carl J. Sherer on "A Purchasing Schedule That Abolished Storerooms" had described the methods followed by the Marmon Motor Car Co. for two years or more.* In discussing it Mr. Hoskins referred to the comment sometimes made on the experiment of the Marmon company, that while such an approach to zero inventories might be made in the automobile industry it would not work anywhere else. The speaker did not agree with this view. Mr. Sherer's paper mentioned four requirements of operation with small inventories: 1. A definite production schedule. 2. A definite schedule of purchases. 3. Reliability of vendors and a close follow-up system. 4. The proper plant layout.

Mr. Hoskins stressed the third requirement and pointed out that particular attention must be given to it if an approach to zero inventories is to be attained. He cited companies which made it a practice to investigate plants of producers of their raw materials, and where price and quality were equal orders were given to those whose operations were most efficient and which were most likely to make deliveries satisfactory both as to time and quality. In this connection he quoted these two paragraphs from Mr. Sherer's paper:

> Our follow-up department keeps in constant contact with the vendor as to the progress of our work in their plant, by regular correspondence and in some cases by personal visits at the plant of the vendor.
>
> In addition, in important cases, it is our custom to receive daily production reports segregated according to major operations, showing the quantities in process at different stages of completion.

This practice of purchasing departments in gathering full data on the ability of sellers to meet their engagements regarding production and delivery he likened to the credit system on the financial side of business. In his opinion the building up of a production credit structure and the giving of a fair chance to the vendor are the main essentials to the success of the new management principle of approach to zero in excess inventories.

*In THE IRON AGE of March 17, page 769, this system was described.

FABRICATED STRUCTURAL STEEL

Awards of Week Total More Than 29,000 Tons and New Business Is 25,000 Tons

Structural steel business continues to make a fair total each week, the past week having brought about 29,000 tons of pending business to the closing point. New projects up for bids total about 25,000 tons. In point of tonnage the outstanding award was 6100 tons for the New York Athletic Club; a bank building in New York takes 6000 tons. A telephone building in Newark on which bids are now being received calls for 4000 tons. Awards follow:

BRIDGEPORT, CONN., 1000 tons, Yellow Mill Pond Bridge, to American Bridge Co.

NEW YORK, 6100 tons, New York Athletic Club, Sixth Avenue and Fifty-ninth Street, reported as going to Post & McCord.

NEW YORK, 6000 tons, National City Bank, 62 Wall Street, to McClintic-Marshall Co.

NEW YORK, 600 tons, office building, West Fortieth Street, to Paterson Bridge Co.

NEW YORK, 300 tons, skating rink in the Bronx, to Easton Structural Steel Co.

NEW YORK, 125 tons, men's home, New York Association for Blind, 603-605 First Avenue, to Shoemaker Bridge Co.

JERSEY CITY, 750 tons, transfer bridges, from Steel & Condit, to American Bridge Co.

NEWARK, N. J., 1000 tons, pasteurizing plant for Borden Farm Products Co., Inc., to Hinkle Steel Construction Co.

BAYONNE, N. J., 100 tons, building for Standard Oil Co. of New Jersey, to American Bridge Co.

PHILADELPHIA, 450 tons, Children's Hospital, to Bethlehem Fabricators, Inc.

WASHINGTON, 4062 tons, 25 river barges for Inland Waterways Corporation, 10 to American Bridge Co. and 15 to Midland Barge Co.

READING, PA., 2300 tons, plant for Textile Machine Works, to McClintic-Marshall Co.

PHILADELPHIA, 450 tons, Children's Hospital, to Bethlehem Fabricators, Inc.

LYCOMING COUNTY, PA., 120 tons, Opp and Beeber bridges, to American Bridge Co.

PENNSYLVANIA RAILROAD, 220 tons, bridge at Clark, Ind., to American Bridge Co.

PENNSYLVANIA RAILROAD, 100 tons, bridge at Chester, Pa., to Bethlehem Steel Co.

BRYN MAWR, PA., 950 tons, hospital, to Lehigh Structural Steel Co.

MORGANTOWN, W. VA., 200 tons, Garlow Building, to Guibert Steel Co.

LUBBOCK, TEX., 300 tons, city construction work, to Pittsburgh-Des Moines Steel Co.

DALLAS, TEX., 500 tons, bridge work for Texas & Pacific Railway, to Virginia Bridge & Iron Co.

CHICAGO, 156 tons, factory for Hills McCanna Co., to an unnamed bidder.

CHICAGO, 125 tons, building for the Belt Railway Co., to Hansell-Elcock Co., Chicago.

CHICAGO, 200 tons, beam sets for the Illinois Central, to A. M. Castle & Co.

CHICAGO, 100 tons, bridges for the Chicago, Burlington & Quincy, to Vierling Steel Works, local.

CHICAGO, BURLINGTON & QUINCY RAILROAD, 225 tons, bridges, to American Bridge Co.

CHICAGO & ALTON RAILROAD, 100 tons, bridges, to McClintic-Marshall Co.

PORT WASHINGTON, WIS., 175 tons, new Mequon bridge, to Worden-Allen Co.

BUTTE, MONT., 500 tons, zinc plant for Anaconda Copper Mining Co., to Worden-Allen Co.

ARCADIA, CAL., 263 tons, municipal pipe line, to Western Pipe & Steel Co.

BEVERLY HILLS, CAL., 160 tons, municipal pipe line, to an unnamed fabricator through R. F. Ware, general contractor.

SELBY, CAL., 100 tons, mill building for American Smelting & Refining Co., to Pacific Coast Engineering Co., Oakland.

SACRAMENTO, CAL., 100 tons, church at Thirteenth and M Streets, to Palm Iron Works, local.

SAN FRANCISCO, 100 tons, addition to St. Joseph's Hospital, to Dyer Brothers, local.

SOUTH SAN FRANCISCO, 100 tons, municipal hangar, to Pacific Structural Iron Works, local.

SAN FRANCISCO, 800 tons, steel barge for Southern Pacific Co., to Moore Dry Dock Co.

GROTTO, WASH., 120 tons, building for the Northwest Portland Cement Co., to Wallace Bridge & Structural Steel Co., Seattle.

HONOLULU, 175 tons, bridge, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

KINGSTON, R. I., 200 tons, engineering building.

NEW YORK, 1500 tons, apartment building, University Place and Tenth Avenue.

NEW YORK, 1500 tons, bridge across Bronx River, Department of Plant and Structures.

NEW YORK, 150 tons, reconstruction girders, High Bridge across Harlem River.

SPRINGFIELD, L. I., 200 tons, building for New York Telephone Co.

GREAT BEND, N. Y., 200 tons, State highway bridge.

NEWARK, N. J., 4000 tons, building for New York Telephone Co.

LANCASTER COUNTY, PA., 100 tons, Marietta bridge.

PHILADELPHIA, 400 tons, Baldwin Locomotive Works for shipment to South America.

CLARKTON, VA., 100 tons, Norfolk & Western Railway bridge.

PADDOCK ROAD, OHIO, 200 tons, railroad bridge for Baltimore & Ohio.

PORTSMOUTH, OHIO, 600 tons, Scottish Rite cathedral; bids close June 14.

DALLAS, TEX., 1000 tons, shops for Texas & Pacific Railway.

KLEBERG, TEX., 3000 tons, shops for Gulf, Colorado & Santa Fe Railway.

SAGINAW, MICH., 450 tons, filtration plant.

CHICAGO, 2000 tons, Roosevelt Road bascule bridge, Strobel Steel Construction Co., Chicago, low bidder.

CHICAGO, 1000 tons, Chicago Club building.

CHICAGO, 2000 tons, garment center building.

CHICAGO, 500 tons, theater and apartment building at Thirty-fifth Street and Auburn Avenue.

CHICAGO & ALTON RAILROAD, 185 tons, miscellaneous bridge work.

ST. LOUIS, 600 tons, municipal service building.

DENVER, COLO., 4000 tons, Southwestern Bell Telephone Co. building.

LEES FERRY, ARIZ., 1000 tons, highway bridge.

SPOKANE, WASH., 728 tons, 18 to 30-in. riveted pipe line; bids June 2.

LOS ANGELES, 1157 tons, San Gabriel dam for the Los Angeles County Flood Control District. Specifications call for 772 tons for a riveted pipe line; 280 tons for gates and valves and 105 tons for trash racks; bids July 11. The district will furnish the steel.

LOS ANGELES, 281 tons, bridge material for the Board of Supervisors; bids June 13.

RAILROAD EQUIPMENT

Lehigh & New England Inquires for 200 Box Cars—Other Inquiries Small

Railroad equipment business, actual and prospective, is mostly in small lots. The largest inquiry is for 200 box cars for the Lehigh & New England. Details of the week's developments follow:

The Illinois Central is expected to place its order for 4500 freight cars within the next week.

The Reading is inquiring for two baggage-horse cars.

The Erie Railroad is inquiring for 10 all-steel dining cars.

The Lehigh & New England is making inquiry for 200 steel-underframe 50-ton box cars.

The Duluth, Missabe & Northern has taken revised bids on 250 ore cars.

The Western Pacific is inquiring for 40 dump cars of 30-cu. yd. capacity.

The Litchfield & Madison is asking for prices on the repair of 247 gondola cars.

The Minnesota Steel Co. is inquiring for six dump cars of 30-cu. yd. capacity.

The Norfolk & Western will build 30 18,000-gal. tenders at its Roanoke, Va., shops.

The Great Northern is inquiring for 10 electric locomotives.

The Chicago, North Shore & Milwaukee has ordered two 65-ton electric locomotives from the General Electric Co.

The Norfolk & Western is asking for bids on the immediate construction of 25 60-ft. all-steel mail storage cars.

The Chicago, Burlington & Quincy is inquiring for four lounge cars.

The Wabash has ordered 12 passenger cars from the Pullman Car & Mfg. Corporation.

The Southern Pacific has awarded six passenger cars to the Pullman Car & Mfg. Corporation.

The Chicago, Milwaukee & St. Paul is in the market for five 200-ton flat cars.

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	May 31	May 28	May 27	May 26	May 25
Lake copper, New York....	12.75	12.62½	12.62½	12.62½	12.75
Electrolytic copper, N. Y.*..	12.37½	12.37½	12.37½	12.25	12.37½
Straits tin, spot, New York.	67.00	....	67.00	67.00	67.75
Lead, New York.....	6.37½	6.37½	6.40	6.40	6.45
Lead, St. Louis.....	6.02½	6.02½	6.05	6.05	6.10
Zinc, New York.....	6.42½	6.40	6.35	6.35	6.37½
Zinc, St. Louis.....	6.07½	6.05	6.05	6.00	6.02½

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, May 31.—Further weakness has developed during the week in nearly all markets with buying heavy in some. Copper prices last week touched the low price of the year, but have firmed up since with heavy buying. At slightly lower levels purchases of tin have been fairly large. Another reduction has been made in lead, but buying has continued light. The zinc market is a little stronger but not active.

Copper.—The tendency to lower prices, which was noted a week ago, developed rapidly until electrolytic copper was quoted on May 26 at 12.50c., delivered in the Connecticut Valley. This is the lowest price since early in February. The history of the market in February has been practically repeated during the last week. Heavy buying by domestic consumers is reported at the 12.50c. price, the quotation advancing at once to 12.62½c., at which some further buying took place. Today the metal is quoted at 12.62½c. to 12.75c., depending on the seller. On May 25 Copper Exporters, Inc., reduced its price from 13.20c. to 13c., c.i.f. Hamburg, where it still stands. At that level buying by leading European countries, such as Great Britain, France, Italy and Germany, has been exceedingly heavy. The expectation in the market is that the domestic price will soon reach 12.75c., delivered. Sales for domestic consumption included deliveries into August, with most of the buying for July shipment. Lake copper today is quoted at 12.75c., delivered.

Copper Averages.—The average price of Lake copper, based on daily quotations in THE IRON AGE, is 12.98½c. The average price of electrolytic copper is 12.65c., refinery, or 12.90c., delivered in the Connecticut Valley.

Tin.—Sales of Straits tin for the week ended Saturday, May 28, totaled about 1000 tons, with dealers the principal buyers. Comment is heard on the ability of consumers to stay out of the market. They are buying some metal but the total is small. The possibility of a corner in May tin, referred to last week, has disappeared, due to several causes, among them some off-setting contracts and the arrival and discharge of tin to apply on regular contracts. The situation, however, was strained and critical at times. Interest now centers in June delivery and the possibility of that being somewhat critical. Because of this most of the buying last week is now confined to the June position with very little May and July tin being involved. There is a drug on the market of 99 per cent tin, which is selling at a discount and even then has not moved much. Statistics for May, out today, Tuesday, indicate deliveries into consumption of 6070 tons with 1604 tons in stock and landing on May 31. Banca shipments to all countries for the month were 2057 tons, or more than usual. Chinese shipments of 127 tons were exceedingly low. Straits shipments for the month will not be available until tomorrow. The market here today, following the holiday was very active, heavy sales for all positions being reported with spot Straits tin quoted at 67c., New York. London quotations today were considerably lower than a week ago, with spot standard quoted at £291 10s., future standard at £284 12s. 6d., and spot Straits £305 10s.

Lead.—On May 26, the American Smelting & Refining Co. again reduced its contract price from 6.50c. to 6.40c., New York. The market is exceedingly quiet with buying confined to carload and small lots for early delivery. Quotations in the outside market range from 6c. to 6.05c., St. Louis, or 6.35c. to 6.40c., New York.

Zinc.—Prime Western zinc touched 6c., St. Louis, during the week, but buying even at that low level,

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	68.50c. to 69.50c.
Tin, bar	70.50c. to 71.50c.
Copper, Lake	14.00c.
Copper, electrolytic	13.75c.
Copper, casting	13.25c.
Zinc, slab	7.00c. to 8.00c.
Lead, American pig	7.50c. to 8.50c.
Lead, bar	9.50c. to 10.50c.
Antimony, Asiatic	15.50c. to 16.00c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure)	29.00c. to 30.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	42.00c. to 43.00c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	72.75c.
Tin, bar	74.75c.
Copper, Lake	14.00c.
Copper, electrolytic	14.00c.
Copper, casting	13.25c.
Zinc, slab	8.00c.
Lead, American pig	7.50c.
Antimony, Asiatic	17.50c
Lead, bar	9.50c.
Babbitt metal, medium grade	22.50c.
Babbitt metal, high grade	77.75c.
Solder, ½ and ½	43.50c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	17.75c. to 18.50c.
Copper, hot rolled	21.50c. to 22.50c.
Copper, cold rolled, 14 oz. and heavier	23.75c. to 24.75c.
Seamless Tubes—	
Brass	22.62½c. to 23.62½c.
Copper	23.50c. to 24.50c.
Brazed Brass Tubes	25.75c. to 26.75c.
Brass Rods	15.50c. to 16.50c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.50c. to 11.00c.
Zinc sheets, open	11.00c. to 11.25c.

Non-Ferrous Rolled Products

Mill prices on copper products were reduced ¼c. on May 27, and brass prices were reduced ⅜c. on the same date. Zinc sheets and lead full sheets are being quoted at the reductions of April 25 and May 16 respectively.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	17.75c.
Copper, hot rolled	21.50c.
Zinc	9.75c.
Lead (full sheets)	10.25c. to 10.50c.
Seamless Tubes—	
High brass	22.62½c.
Copper	23.50c.
Rods—	
High brass	15.50c.
Naval brass	18.25c.
Wire—	
Copper	14.75c.
High brass	18.25c.
Copper in Rolls	20.37½c.
Brazed Brass Tubing	25.75c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	35.50c.
Tubes, base	45.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

	Base per Lb.
Sheets—	
High brass	18.75c.
Copper, hot rolled	21.50c.
Copper, cold rolled, 14 oz. and heavier	23.75c.
Zinc	11.00c.
Lead, wide	10.00c.
Seamless Tubes—	
Brass	24.12½c.
Copper	25.00c.
Brazed Brass Tubes	28.00c.
Brass Rods	15.50c.

the lowest in several years, was by no means heavy. Since then prices have advanced slightly, until today the metal is available at 6.05c. to 6.10c., St. Louis, but the market is quiet. Ore prices continue at $38 per ton, Joplin, with production 10,000 to 11,000 tons during the week, which is relatively low, and with producers reported as holding the ore for higher prices.

Antimony.—The market is quiet with demand very light. Prices for Chinese metal are a little easier at 13.25c., duty paid, for all positions.

Nickel.—Wholesale lots of ingot nickel are unchanged at 35c. with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Aluminum.—Virgin metal, 98 to 99 per cent pure is quoted at 25c. to 26c. per lb., delivered.

Non-Ferrous Metals at Chicago

May 31.—This market is quiet and the price of copper is notably weak. Quotations on tin and lead show some strength. The old metal market is weak and dull.

We quote in carload lots: Lake copper, 13c.; tin, 69c.; lead 6.30c.; zinc, 6.15c.; in less than carload lots, antimony, 14.50c. On old metals we quote copper wire, crucible shapes and copper clips, 9.75c.; copper bottoms, 8.75c.; red brass, 8.75c.; yellow brass, 7c.; lead pipe, 4.75c.; zinc, 3.50c.; pewter, No. 1, 34c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 14c.; all being dealers' prices for less than carload lots.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	11.00c.	12.25c.
Copper, heavy and wire	10.75c.	11.75c.
Copper, light and bottoms	9.25c.	10.50c.
Brass, heavy	7.00c.	8.50c.
Brass, light	5.75c.	7.25c.
Heavy machine composition	8.75c.	10.125c.
No. 1 yellow brass turnings	7.50c.	8.25c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	5.00c.	5.625c.
Lead, tea	4.00c.	4.50c.
Zinc	4.00c.	4.25c.
Sheet aluminum	14.50c.	16.50c.
Cast aluminum	14.50c.	16.50c.

REINFORCING STEEL

Awards Show Seasonal Expansion, With Total of Nearly 12,000 Tons

Concrete reinforcing steel awards in the week, as reported to THE IRON AGE, totaled close to 12,000 tons, which was considerably higher than the recent average. The contracts included 3100 tons for a viaduct at Los Angeles, 1600 tons for a warehouse in Pittsburgh and 2000 tons for a warehouse in Cleveland. New projects under negotiation total about 7700 tons. Awards follow:

NEW YORK, 1000 tons of open-hearth bars, for subway work, from Board of Transportation, to Friedrich Krupp A. G., Essen, Germany.

NEW YORK, 150 tons, Selcher Fireproof Storage Co. warehouse, to Truscon Steel Co.

YONKERS, 150 tons, post office, to Kalman Steel Co.

BOSTON, 125 tons, John Hancock Life Insurance building, to Barker Steel Co.

CAMBRIDGE, MASS., 125 tons, pipe tunnels, Harvard College, to Barker Steel Co.

PITTSBURGH, 1600 tons, Joseph Horne Co. warehouse, to Carlem Engineering Co., Pittsburgh.

CLEVELAND, 2000 tons, warehouse for Distribution Terminals Co. to Bourne-Fuller Co.

CINCINNATI, 350 tons, warehouse for Cincinnati Wholesale Grocers Co., to Pollak Steel Co.

CINCINNATI, 200 tons, reconstruction of Music Hall, to Pollak Steel Co.

HAMMOND, IND., 145 tons, first section State line generating station, to Concrete Steel Co.

TELL CITY, IND., 800 tons of rail steel, to Concrete Steel Co.

CHICAGO, 150 tons of rail steel, apartment building, to Barton Spiderweb System.

CHICAGO, 200 tons, Ear, Eye, Nose & Throat Hospital, to Concrete Steel Co.

CHICAGO, 600 tons of rail steel bars, hotel on Ohio Street, to American System of Reinforcing.

EVANSTON, ILL., 200 tons of rail steel, store building at Sherman and Orrington Avenues, to an unnamed bidder.

LOS ANGELES, 3100 tons, Glendale-Hyperion viaduct, to unnamed firms through Lange & Bergstrom, general contractors.

LOS ANGELES, 305 tons, hospital and nurses' home on Sunset Boulevard, to an unnamed local jobber.

LOS ANGELES, 118 tons, warehouse wharf deck, berth 228-D & E, Los Angeles harbor, to an unnamed firm.

LOS ANGELES, 225 tons, office building on Hill Street, to an unnamed company.

SACRAMENTO, CAL., 250 tons, State highway construction between Dublin and Livermore, Cal., to Truscon Steel Co.

SACRAMENTO, 200 tons, for construction of municipal sand-filters, to Truscon Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

CLEVELAND, 2000 tons, May Co. warehouse.

CAMBRIDGE, MASS., 600 tons, Kendall Square Associates building.

CINCINNATI, 125 tons, reconstruction of Harrison Avenue viaduct.

HAMMOND, IND., 300 tons, second section State line generating station.

CHICAGO, tonnage being estimated, apartment building at Jeffery Avenue and Seventy-second Street; Paul F. Olson, architect.

CHICAGO, estimate being prepared, Roosevelt Road viaduct.

CHICAGO, 240 tons, building for the Wieland Dairy Co.

CHICAGO, tonnage being estimated, apartment building at Ohio and St. Clair Streets; Oman & Linenthal, architects.

GLENCOE, ILL., 200 tons, filtration and pumping plant.

SPRINGFIELD, ILL., 1500 tons of rail steel, State road work.

ST. LOUIS, 700 tons, service building for city of St. Louis, Twelfth Boulevard and Clark Street.

LOS ANGELES, 1200 tons, San Gabriel Canyon dam for the Los Angeles County Flood Control District; bids July 11, steel will be furnished by the district.

LOS ANGELES, 130 tons, hospital on Waterloo Street.

LOS ANGELES, 500 tons, Drainage Improvement District No. 20; bids June 16.

LOS ANGELES, 200 tons, bridge, North Spring Street; Western Construction Co. low bidder.

Ohio Employment Varies

Employment in Ohio foundries and machine shops increased 3.1 per cent in April, as compared with March, and 10.5 per cent compared with April, 1926, according to the monthly bulletin of the Bureau of Business Research of Ohio State University. With an average month of 1923 taken as 100, the index figure stood at 103.5.

There was little change, however, in the employment situation in Ohio steel works and rolling mills. The number of wage earners in April declined 1 per cent from March, but was about 1 per cent higher than in April, 1926. The average daily wage payments decreased 3.3 per cent from March. In the construction industry April normally shows a seasonal upturn of about 22 per cent, but current April reports from 83 general contractors reveal an increase of only 1.3 per cent in the number of men employed. Compared with April last year this represents a decrease of 5.7 per cent.

MORE ON LINDBERGH PLANE

Composition of Chrome-Molybdenum Tubing—Facts About Earth Inductor Compass

BRIEF mention was made in an article in THE IRON AGE, May 26, on the Lindbergh plane that chrome-molybdenum steel tubing was used in the framework of the fuselage.

Further data have been obtained from the company which made the tubing, the Summerill Tubing Co., Bridgeport, Montgomery County, Pa. The chrome-molybdenum tubing was used in the framework of the under carriage, the chassis and the tail skids of the plane built by the Ryan Air Lines, Inc., San Diego, Cal. Various sizes and gages were used and the steel has the following composition: Carbon, 0.25 to 0.35 per cent; chromium, 0.80 to 1.10; molybdenum, 0.15 to 0.25; sulphur, 0.045 maximum; phosphorus, 0.040 maximum; manganese, 0.40 to 0.60.

"This tubing was heat treated to bring its physical properties up to a minimum elastic limit of 60,000 lb., and a minimum tensile strength of 95,000 lb. per sq. in., which are the requirements of the United States Army and Navy specifications." It is understood that the usual heat treatment for such tubing is to bring it to a temperature of 1575 deg. Fahr., followed by water quenching and a draw from 900 to 1200 deg. Fahr.

The Summerill company points out that it is common practice to build welded fuselage today, but whether the welding, which was done by the oxy-acetylene process, was followed by heat treatment was not ascertained. The difficult take-off demonstrated that the under-carriage of the plane was of unusually substantial construction because it withstood the great strain of plowing through mud heavily loaded.

The Alan Wood Iron & Steel Co., Philadelphia, furnished the billet steel from which some of the parts of the Wright "Whirlwind" motor used by Lindbergh were forged.

Some Details About the Inductor Compass

The Bureau of Standards has issued a memorandum giving some facts regarding the earth inductor compass invented at the bureau, as used by Captain Lindbergh in his record flight. The device was perfected about five years ago and the bureau was awarded the Magellan medal of the American Philosophical Society for the accomplishment. Says the bureau:

> In addition to being so essential an accessory of the renowned achievement of Captain Lindbergh, the earth inductor compass was one of the principal instruments used in navigating the planes of the American round-the-world flyers. Thus it has been an important agent in at least two of the pioneer developments of modern aviation.
>
> The earth inductor compass operates on the principle that the voltage of a direct current dynamo is changed by changing the angle between the field and the brushes. In the compass the earth's magnetic field replaces the field magnet of the dynamo, and the brushes are mounted on the airplane and turn with it. The armature is driven by a wind wheel. The compass has many advantages over the ordinary magnetic compass. It is almost free from roll and pitch errors, and the parts affected by the magnetism of the airplane's power plant may be placed in the tail of the plane, while the indicating instrument is located in the most convenient position for the pilot. The two parts are connected by ordinary wires. Besides its successful use on aircraft, the earth inductor compass has also been tested on vessels of all kinds, and has shown many important advantages over the usual mariner's compass.

Metric Campaign Based on Illegality

(*Concluded from page* 1617)

that the officials of the executive departments at Washington "be made to confine their activities to their duties as defined by law, to recognize the exclusive authority of Congress over the United States standard of weights and measures, to conform to the exact identity of the English yard and pound in the United States and British Commonwealth of Nations, and to eschew all propaganda, direct or indirect, open or secret, having for its object to extend the use of the metric system in the United States or any of its outlying possessions."

A second recommendation is "that the United States Government should obtain without a moment's unnecessary delay material standards of the English yard and pound, made by the best methods possible in the existing state of science and the arts."

An appendix to Mr. Dale's statement consists of more than 12 pages of documentary citations—a masterly marshalling of evidence. These establish on the one hand, by quotations from the constitutions of the several States and by extracts from Government and other documents, the exact identity of English standards of weights and measures. On the other hand are plainly brought out the successive steps in the campaign to discredit the legal standards of the United States and to displace them by standards which metric propagandists have long sought to force upon the country.

Progress on Gary Continuous Roughing Tin Plate Mill

Work on the installation of the new continuous mill at the Gary tin plate plant of the American Sheet & Tin Plate Co. is running well ahead of schedule and it now is probable that its mill will be in operation soon after Oct. 1 instead of early in 1928, as at first expected. Production of this plant will be increased 50 per cent by this mill, on which the sheet bars will be rolled down to about No. 19 gage and then after reheating rolled down to tin plate gages on the existing mills.

Sales of Foundry Equipment Decline

Sales in April by members of the Foundry Equipment Manufacturers' Association, Cleveland, totaled $478,273, or a loss of 6 per cent as compared with the March figure. Shipments in April, aggregating $601,808, were only 0.03 per cent below those of March. April sales were 1½ per cent larger than those for the same month in 1926. Shipments in April showed a gain of 33 per cent as compared with April, 1926. Orders on hand May 1, at $838,752 were 18 per cent smaller than on April 1.

COMING MEETINGS

June

American Association of Engineers. June 6 to 8. Annual meeting, Tulsa, Okla. M. E. McIver, 63 East Adams Street, Chicago, acting secretary.

National Association of Purchasing Agents. June 6 to 9. Annual meeting, Hotel Pantlind, Grand Rapids, Mich. W. L. Chandler, Mishawaka, Ind., secretary.

American Foundrymen's Association. June 6 to 10. Annual convention, Edgewater Beach Hotel, Chicago. C. E. Hoyt, 140 South Dearborn Street, Chicago, secretary.

National Supply and Machinery Distributers' Association, Southern Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association. June 13 to 17. Twenty-second annual convention, on board S. S. Noronic leaving Detroit, June 13. George A. Fernley, 505 Arch Street, Philadelphia, secretary.

Association of Iron and Steel Electrical Engineers. June 13 to 18. Twenty-third annual convention and exposition, Syria Mosque, Pittsburgh. John F. Kelly, Empire Building, Pittsburgh, secretary.

American Society for Testing Materials. June 20 to 25. Twenty-fifth annual meeting, French Lick Springs Hotel, French Lick, Ind. C. L. Warwick, 1315 Spruce Street, Philadelphia, secretary.

PERSONAL

Ernest E. Thum, who for the past four years has been manager of the technical publicity department of the Linde Air Products Co. and associated subsidiaries of the Union Carbide & Carbon Corporation, joined THE IRON AGE organization on June 1 as associate editor. Mr. Thum has an unusual combination of experience in technical journalism and in metallurgical operations. He had his grammar and high school training at Pueblo, Colo., and then entered the Colorado School of Mines from which he graduated in 1906 with the degree of engineer of mines. Prior to 1906 he had summertime work in the steel plant and drawing room of the Colorado Fuel & Iron Co. at Pueblo. From 1906 to 1914 he was connected with the Anaconda Copper Mining Co., first as field engineer and draftsman, later a chief civil engineer of the Tooele Valley Railway and of Tooele smelter construction, and from 1910 to 1914 as chief engineer at Great Falls smelter. He was professor of metallurgy at the University of Cincinnati in 1914-17 and for the next six years was metallurgical editor of *Chemical and Metallurgical Engineering*, a McGraw-Hill publication.

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Samuel Frankel, for many years chief metallurgist and works manager of Alloys & Products, Inc., New York, has been appointed chief metallurgist of the Niagara Falls Smelting & Refining Corporation, 2204 Elmwood Avenue, Buffalo.

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John R. Mears, who has been manager of the Chicago office of the Chisholm-Moore Mfg. Co., Cleveland, for the last five years, has been appointed sales manager with headquarters at the home office. William J. Scott, who succeeds Mr. Mears at Chicago, has been identified with that office for more than four years.

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Charles Bond, president of the Charles Bond Co., 617 Arch Street, Philadelphia, manufacturer of power transmitting machinery, leather belting, handling equipment, etc., has sailed for the British Isles, where he will remain for six weeks.

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Robert James Mitchinson, for three years general foreman in the steel shop of the Gifford Wood Co., Hudson, N. Y., has been made manager of the Holmes Iron Co., Rutland, Vt., succeeding John Holmes, who has retired after having been associated with the company since 1881. Mr. Mitchinson came to this country in 1922 from England, where he had been employed for 20 years by Sir W. Gray & Co. He served for a year as inspector for the New England Structural Co., Boston, before going to the Gifford Wood Co.

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T. C. Pulman, managing director Worthington-Simpson, Ltd., British subsidiary of the Worthington Pump & Machinery Corporation, New York, and J. B. Farwell, foreign manager of the company, with headquarters at Paris, are in this country for a three weeks' conference with L. J. Belnap, president of the Worthington organization.

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Charles D. Rice, general manager Underwood Typewriter Co.; George A. Long, secretary and general manager Gray Telephone Pay Station Co.; Arthur W. Fox, vice-president Billings & Spencer Co.; Clayton R. Burt, vice-president Pratt & Whitney Co.; and Edward Balf, representing the Manufacturers' Association of Hartford County, Conn., have been made a committee to arrange for a memorial to those Hartford men who laid the foundation of that city's industrial standing, which is to be located in the new trade school at that city. Among those prominent in the city's early industrial activity were Samuel Colt, Amos Whitney, Francis Pratt, Charles E. Billings, Christopher Spencer and Ernest Cady.

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S. J. Ruddock has been appointed purchasing agent of the Ferro Machine & Foundry Co., Cleveland, succeeding A. J. Hopcraft who recently resigned. Mr. Ruddock has been connected with the company for 12 years and since leaving the army at the close of the war has been assistant purchasing agent.

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W. C. Schade has been placed in charge of the new sales office recently opened at 406 Bessemer Building, Pittsburgh, by the C. O. Bartlett & Snow Co., Cleveland.

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H. J. Freyn, Freyn Engineering Co., Chicago, is now returning from a nine weeks' stay in Russia, where he was retained by the Soviet government for consulting engineering work in connection with iron and steel plant expansion and modernization.

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W. C. Cutler, recently sales agent in the bar division, Bethlehem Steel Co., Bethlehem, Pa., has been appointed special representative of the general sales department. He is succeeded in the bar department by Louis R. Steuer. John F. Hazen has been appointed sales agent in the wire, nails and fence department. All have been associated with the company for several years and will continue to maintain headquarters at Bethlehem.

Announce Changes in Operating Personnel of General Electric Co.

C. C. Chesney, general manager of the Pittsfield, Mass., works of the General Electric Co., has been elected vice-president of the company and will act as chairman of the manufacturing committee. Associated with him in the administration of the manufacturing department will be W. R. Burrows, formerly associate manager of the company's incandescent lamp department, and C. E. Eveleth, recently manager of its Schenectady works, both of whom have also been elected vice-presidents. F. C. Pratt, vice-president in charge of manufacturing, has retired. Mr. Pratt came to the company in 1906, and was identified with it continuously until illness forced his partial retirement last year. Since that time G. E. Emmons has been in charge of the department. H. F. T. Erben, assistant vice-president of the manufacturing department, has also announced his retirement, effective at the close of 1927, when he will have served the company 40 years.

Chester W. Rice, who has been engaged in development work in the research laboratory of the General Electric Co., has been named assistant to E. W. Allen, vice-president in charge of engineering, and will give special attention to new developments. W. S. Moody, in general charge of the transformer engineering department of the company since its inception, has been appointed a consulting engineer for all transformer departments of the company and for all departments of its Pittsfield works. Mr. Moody will continue to make his headquarters at Pittsfield and, as chairman of the steel standardizing committee, will have general direction of all department work on magnetic steel. F. W. Peek, Jr., who has been named to succeed Mr. Moody as engineer of the general transformer department, has been a consulting engineer in the transformer department and in charge of the high voltage testing laboratory.

E. W. Rice, Jr., has been named honorary chairman (ex-officio) of the engineering council recently established by the electric company to advise with the vice-president in charge of engineering on various problems which arise. E. W. Allen is chairman of the committee, and other members are Elihu Thomson, A. C. Davis, W. R. Whitney, W. L. R. Emmet, C. C. Chesney and C. E. Eveleth. The council may invite other engineers to meet with it, and at such times may give them the status of regular members.

Noah W. Elliott, president Elliott-Blair Steel Co., New Castle, Pa., has been granted a patent on a device for cold strip mills. For the gear drive of the rolls it substitutes a chain drive, which is claimed to provide an evener finish for the rolled product.

STEEL TREATERS ACTIVE

New Officers of Several Chapters—Other News —Semi-Annual Meeting at Montreal in 1928

Some of the activities of a few of the chapters of the American Society for Steel Treating are recorded in the following paragraphs:

The annual frolic of the New Haven Chapter, New Haven, Conn., will be held at Wilcox's Pier Restaurant, Savin Rock Park, Thursday, June 9, at 7 p. m. Reservations must be in the hands of the secretary or treasurer by noon, Wednesday, June 8.

The eighth annual banquet of the Hartford chapter, Hartford, Conn., will be held Tuesday evening, June 7, at the City Club. The chief speaker of the evening will be Hon. Herbert Knox Smith, Farmington, Conn., who will discuss "Foreign Relations." Mr. Smith attended the Geneva Peace Conference and can, therefore, speak with authority on this subject. The toastmaster will be Clayton R. Burt, vice-president and general manager Pratt & Whitney Co. The entertainment for the evening will consist of a "novelty pianist and five singing and dancing maidens."

At the regular meeting of the Buffalo chapter, May 26, the following officers were elected for the coming year: Chairman, B. L. McCarthy, Wickwire Spencer Steel Co.; vice-chairman, B. Clements, Curtiss Aeroplane & Motor Co.; secretary-treasurer, F. L. Weaver, American Radiator Co.

The Cleveland chapter held its regular May meeting the evening of May 20 and elected the following officers for the ensuing year: Chairman, Harry H. Smith, metallurgist Bourne-Fuller Co.; vice-chairman, W. H. White, Atlas Steel Corporation; secretary-treasurer, J. S. Ayling, Case-Hardening Service Co.

The Cincinnati chapter held its monthly May meeting on the evening of May 26 and was addressed by Marcus Grossman, metallurgical engineer Central Alloy Steel Corporation, Canton, Ohio. He took as his subject "The Heat Treatment of Alloy Steels Including Stainless Steel and Iron."

New officers for the coming year for the Syracuse, N. Y., chapter were elected on May 17 and were as follows: Chairman, W. R. Frazer, Halcomb Steel Co.; vice-chairman, J. J. Driscoll, Sanderson Works, Crucible Steel Co. of America; secretary-treasurer, S. P. Peskowitz, Halcomb Steel Co.

The Chicago chapter elected its new officers for the coming year at its regular meeting, May 12, as follows: Chairman, T. E. Barker, Accurate Steel Treating Co.; vice-chairman, A. M. Steever, Great Lakes Forge Co.; secretary-treasurer, Arthur G. Henry, Danly Machine Specialties, Inc.

At the regular monthly meeting of the Indianapolis chapter held May 23 in the Y. M. C. A. auditorium, F. R. Palmer, metallurgist Carpenter Steel Co., Reading, Pa., delivered an informal illustrated address on "Something New in the Heat Treatment of High-Speed Steels." The president of the national society, J. Fletcher Harper and the secretary, William H. Eisenman, were present. Mr. Harper delivered a brief address on "The 'Why' of the A. S. S. T." and Mr. Eisenman reported on the progress made by the society recently. A special entertainment and musical program were furnished by a group of men from the Delco Remy Division of the General Motors Corporation, Anderson, Ind.

The first meeting of the Canton-Massillon chapter was held at the Canton Club in Canton on the evening of May 26. The chief speaker was Dr. Zay Jeffries, research department Aluminum Co. of America, and treasurer of the national society.

The Rochester chapter elected its new officers for the coming year on Monday evening, May 9, as follows: Chairman, George C. Van Vechten, plant engineer Stecher Lithograph Co.; vice-chairman, C. F. Wattel, metallurgist North East Electric Co.; secretary-treasurer, I. C. Matthews, research chemical engineer Eastman Kodak Co.

Swan Hillman, National Lock Co., was reelected chairman of the Rockford, Ill., chapter at the annual meeting recently. R. M. Smith was elected vice-chairman and O. T. Muehlmeyer, secretary-treasurer, was reelected. An address was given by F. A. Bonte, metallurgist Union Drawn Steel Co., Beaver Falls, Pa., on "Manufacture of Cold Drawn Steel." A collection of $50 was taken at the meeting and donated to the Red Cross Flood Fund.

The St. Louis chapter held its 67th regular meeting Tuesday evening, May 4, and elected the following officers for the coming year: Chairman, W. D. Thompson, Laclede Gas Co.; vice-chairman, W. E. Remmers, Washington University; secretary-treasurer, C. G. Werscheid, Crucible Steel Co. of America. Dr. John A. Mathews, vice-president Crucible Steel Co. of America, delivered an excellent address on "Iron in Antiquity and Today," which was illustrated with lantern slides. It is stated that this is based on a hobby of Doctor Mathews which has taken the form of a collection of a library of historical books on metallurgy and magnetism dating from 1540 down to the present day. The speaker paid special reference to the remarkable developments of iron in this country during the past 50 years.

Semi-Annual Convention Next Year

At the meeting of the board of directors of the A. S. S. T. at Milwaukee, May 18, it was decided to hold only one sectional meeting each year and to call it a semi-annual meeting. The 1928 meeting of this nature is scheduled for Montreal, date to be selected later.

OBITUARY

P. WILLIAM KROMER, Buffalo district manager for the Air Reduction Sales Co., 342 Madison Avenue, New York, died at the Buffalo General Hospital on May 21, aged 47 years. He entered the oxyacetylene industry some 20 years ago, and was associated for some time with Searchlight Co., Buffalo. He also served as manager of a job welding shop at Binghamton, N. Y. Before becoming associated with the Air Reduction company in 1916 he was New York manager for the Niagara Oxygen Co., Buffalo. Mr. Kromer was a member of the American Welding Society.

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A. L. D. BUXTON, president Perry-Buxton-Doane Co., Boston, old material dealer, died on May 30 at his home in Worcester, Mass., aged 75 years. He was a director of the Eastern Bridge & Structural Steel Co. and of the Coburn Trolley Truck Mfg. Co., both of Worcester.

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JOHN L. MCCARTNEY, since 1904 Pittsburgh district sales manager for the Niles-Bement-Pond Co., New York, died at the Southside Hospital, Pittsburgh, on May 28, as the result of injuries sustained in an automobile accident. He was born at Springfield, Ohio, 62 years ago, but had spent his entire business life in Pittsburgh in the machinery and machine tool industry. Prior to his association with the Niles organization he was identified with the Baird Machinery Co.

EDWIN C. JACKMAN, for many years in charge of sales west of Pittsburgh for the Firth-Sterling Steel Co., McKeesport, Pa., died on May 30 at Santa Barbara, Cal., where he had gone for a vacation. He was 62 years of age. He had operated as a mill representative under the name of E. S. Jackman & Co. in Cleveland, Detroit, Chicago and Los Angeles. Mr. Jackman was a brother of D. E. Jackman, treasurer of the Firth-Sterling company.

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JAMES WARREN LANE, president of the E. W. Bliss Co., Brooklyn, died on May 21 at his home in St. James, L. I. He was 63 years of age, and had been at the head of the Bliss organization since the death of its founder in 1903. He was graduated from College of the City of New York in 1884, and was for some time associated with the J. H. Stanley Co., a firm of cotton merchants established by his father. In later life his business activities had become more varied, and besides association with the companies mentioned, he was president of the West Boylston Cotton Mfg. Co., president of the Pascommock Co., a director of the J. T. Perkins Co. and a director of the Equitable Trust Co.

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G. A. MECKEL, superintendent of the William B. Scaife & Sons Co., Oakmont, Pa., died suddenly on May 16 at the home of his daughter in Frederick, Md. He had been associated with the company for 64 years, 51 as general superintendent of the mill.

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GEORGE C. MURRAY, president Keyoke Railway Equipment Co., Chicago, died, May 21, at his home in that city, following a long illness.

Machinery Markets and News of the Works

INCREASE IN SALES

Bookings During May Show Some Improvement Over April

Fair Volume of Pending Business Expected to Be Closed Next Month

REPORTS from the Cincinnati, Cleveland and New England districts indicate improvement in bookings of machine tools during the past week.

Sales in May, with a considerable number of companies, were larger than for April, this increase in the case of the Cincinnati district being estimated at from 10 to 15 per cent. For most Cincinnati machine tool builders the bookings also exceeded those of May, 1926.

The outlook for the closing of inquiries now pending is regarded as promising.

Demand from the automotive industry is generally only moderate. The Ford Motor Co. is buying some special tools. Of interest is the announcement by officials of the Ford company of a new model Ford car, but no official description has been made public. It is understood that there will be no "total shutdown" while the Ford plants are being equipped for the new model.

Purchases by the railroads include several lathes for the Southern and the Baltimore & Ohio railroads. The Santa Fe continues to buy on its list, orders for several grinding machines having been placed last week. The Northern Pacific has also purchased a few miscellaneous tools.

New York

NEW YORK, May 31.

MACHINE tool business in the past week has brought no new developments. Orders continue in small units and the totals are not large. Among the week's sales are the following: Two 1-spindle drilling machines to a Bridgeport, Conn., company; a 6-in. vertical shaper to a Michigan radiator company; a vertical drilling machine to a novelty manufacturer in California; two 16-in. cone-head lathes to a valve manufacturer in Massachusetts; two arbor presses to a Hartford, Conn., company; a 6-in. vertical shaper to a radiator company near Buffalo; a vertical shaper to a tool manufacturer in Ohio; also one to a specialty company in Cleveland; and another to an ignition manufacturer in Indiana; a duplex hand centering machine to a sewing machine manufacturer in Connecticut; a vertical shaper to a Detroit automobile company; a 16-in. lathe to a Woonsocket, R. I., manufacturer; a 6-ft. radial drill to a Pennsylvania company; a 53-in. tire mold to a Hamilton, Ohio, company; a 100-ton bushing press to the Texas & Pacific Railroad; a 48-in., 400-ton wheel press to a Chicago foundry company.

The New York Central Railroad Co., 466 Lexington Avenue, New York, is planning an addition to its electric generating plant at Yonkers, N. Y., to increase the output from 20,000 to 40,000 kwh., to be used in connection with the electrification of its line from Seventy-second Street to Spuyten Duyvil. Plans are also under way for the construction of electric power substations at Dykman Street, at 133rd Street, and at Sixty-sixth Street.

Fire, May 21, destroyed a portion of the four-story plant of the Charles Hvass Co., 508 East Nineteenth Street, New York, manufacturer of street-cleaning machinery, including sprinklers, flushers, etc., with loss reported at $35,000 including equipment.

The Lynbrook Iron Works, 309 Earl Avenue, Lynbrook, N. Y., has plans under way for a new one and two-story plant to cost close to $55,000 with equipment. Henry Mugler, 185 Sherman Street, is architect.

The E. A. Laboratories, Inc., Spencer Street and Myrtle Avenue, Brooklyn, manufacturer of automobile horns and other signal equipment, has awarded a general contract to the Barney Ahlers Construction Co., 110 West Fortieth Street, New York, for a new six-story plant, 100 x 150 ft., to cost in excess of $250,000 with equipment. Henry Manley, 5 East Fifty-third Street, New York, is architect and engineer.

The Union Free School District No. 1, Tuckahoe, N. Y., plans the installation of manual training equipment in a new three-story high school at Tuckahoe Avenue and the White Plains Road to cost $550,000, for which bids are being asked on a general contract until June 23. Tooker & Marsh, 101 Park Avenue, New York, are architects.

The Superintendent of Lighthouses, Staten Island, N. Y., is asking bids until June 20, for 32 steel bodies with skeleton lantern tower for various types of gas buoys, all with bottom counterweights, proposal 24068.

Paymer Brothers, 361 Borden Avenue, Long Island City, metal products, have awarded a general contract to H. Rosen, 796 Montgomery Street, Brooklyn, for a new one-story plant, 50 x 200 ft., to cost about $25,000 with equipment.

The Board of Education, 500 Park Avenue, New York, plans the installation of manual training equipment in a new four-story high school at Richmond Hill, estimated to cost $1,700,000, for which bids are being asked on a general contract until June 7. William H. Gompert, Flatbush Avenue Extension and Concord Street, Brooklyn, is architect.

The Automatic Wrench Corporation, 50 Church Street, New York, has purchased property at Dover, N. J., and plans the early erection of a new plant for the manufacture of a patented wrench in different sizes. The initial unit will approximate 50,000 sq. ft. of floor space and is reported to cost close to $100,000 with equipment.

The General Lock Works, Inc., William and Kingsland Avenues, Harrison, N. J., care of J. H. Moriarty, 15 Exchange Place, Jersey City, N. J., recently organized with a capital of $50,000, is said to be planning the operation of a factory for the manufacture of trunk hardware. Daniel Rentschler heads the company.

The Merchants Refrigerating Co., 41 River Street, Newark, has plans for a new refrigerating and cold storage plant unit to cost in excess of $75,000 with equipment. J. B. Snook, 52 Vesey Street, New York, is architect.

The Lidgerwood Mfg. Co., 326 Frelinghuysen Avenue, Newark, manufacturer of hoisting engines and machinery, has work in progress on the first unit of its new plant in the Bayway section, Elizabeth, N. J., to cost more than $150,000. It will replace the works now located at the foot of Dikeman Street, Brooklyn, which will be removed to the new site. Russell G. Cory, 30 Church Street, New York, is architect and engineer.

The H. M. Shear Co., Quincy, Ill., maker of incubating equipment, has opened an office at 116 Broad Street, New York, from which export sales will be handled. F. C. Turner is in charge.

The Gem of America Motor Car Corporation, 9 Lafayette Street, Riverside, N. J., has been organized with a capital of $1,000,000 to manufacture a patented transmission mechanism, permitting gears to be constantly engaged. G. E. Mellonis is president.

The Portable Machinery Co., formerly at Passaic has been removed to Clifton, N. J.

The Crane Market

MUCH of the current inquiry for overhead cranes is apparently for small capacity equipment, but there are still a number of sizable orders not yet placed. In the locomotive crane field, the inquiry of the New York Central Railroad for two 20-ton cranes is still open and the greater part of the list of the Amtorg Trading Corporation, 165 Broadway, New York, is still to be closed, two 40-ton locomotive cranes having been purchased this week.

Among recent purchases are:

Elberton Quarries, Inc., Elberton, Ga., a 25-ton standard gage locomotive crane from the American Hoist & Derrick Co.

Amtorg Trading Corporation, 165 Broadway, New York, two 40-ton locomotive cranes for export to Russia from an unnamed builder.

Boston & Maine Railroad, Boston, two 25-ton locomotive cranes from the Brown Hoisting Machinery Co.

Carnegie Steel Co., Duquesne, Pa., three 175-ton ladle cranes, from the Alliance Machine Co.

Cleveland

CLEVELAND, May 30.

MACHINE tool sales in this territory showed a slight improvement the past week, during which some manufacturers and dealers took more business than in any previous week of the month. All orders were for single machines. The volume of business during May with some manufacturers and dealers increased a little over April, but with others it has not been quite as good as during the previous month. As a whole, the May volume seems to have been a trifle better than that in April. The Ford Motor Co. is buying some machinery, largely in special tools, but aside from this demand from the automotive industry in the Michigan territory remains very dull and not much business is expected until the motor car companies prepare to bring out late season models.

The Dickerman Hoist Mfg. Co., Cleveland, has been organized to manufacture chain hoists, handle trolleys and power cranes and has established an assembling plant at 872 East Seventy-second Street. Later it expects to build a manufacturing plant. H. E. Dickerman is president and V. J. Rumpler is secretary and treasurer. Both have long been affiliated in the same line of business with the Chisholm & Moore Mfg. Co., Cleveland, of which Mr. Dickerman was sales manager and Mr. Rumpler assistant sales manager and advertising manager.

The Euclid Crane & Hoist Co., Chardon Road Cleveland, plans the construction of a one-story factory addition, 40 x 170 ft.

The Lambert Tire & Rubber Co., Akron, Ohio, has been organized under State laws, to take over the local plant and business of the company of the same name. Plans are under consideration for expansion. George Seiberling is president and general manager of the new company.

Officials of the B. F. Goodrich Co., Akron, Ohio, have organized a subsidiary company to be known as the Pacific Goodrich Rubber Co., to construct and operate its proposed mill on property recently acquired on Mines Avenue, Los Angeles. Plans are under way for the initial unit, and it is understood that bids will be asked soon. The plant is estimated to cost upward of $2,500,000 including machinery.

Crook Son & Co., Hicksville, Ohio, are having plans drawn for a one-story wood-working plant to cost about $30,000 with equipment. Guy Mahurin, Standard Building, Fort Wayne, Ind., is architect.

Pittsburgh

PITTSBURGH, May 30.

Bids will soon be asked by the General Motors Corporation, Detroit, for its one and two-story assembling and service plant on Liberty Avenue, Pittsburgh, to cost approximately $375,000 with equipment, instead of a smaller amount previously reported. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

The Crystal Block Mining Co., Sprigg, W. Va., has authorized plans for a new tipple at its Gates mine, to replace a structure recently destroyed by fire. It will cost about $65,000 with machinery, including loading boom, conveyors, shaker screens, etc. J. M. Tulley is general manager.

The American Thermos Bottle Co., West Ninth Street, Huntington, W. Va., will make extensions and improvements in the furnace department at its local works, including remodeling of existing units and installation of additional equipment. Headquarters are at Norwich, Conn. G. C. Ashton is manager at Huntington.

The Pure Oil Co., Morgantown, W. Va., is said to be planning to rebuild the portion of its local oil storage and distributing plant destroyed by fire, May 24, with loss reported at more than $200,000 including equipment. Headquarters are at Wabash Avenue and Wacker Drive, Chicago.

The Mercer Coal & Iron Co., Tomhicken, Pa., has leased the former No. 5 local coal mine of the Coxe Mining Co., and will reopen the property. Plans are under way for a new coal breaker to cost more than $50,000.

The Berwind-White Coal Mining Co., Windber, Pa., has awarded a general contract to the Truscon Steel Co., Pittsburgh, for a one-story machine shop to cost about $25,000 with equipment.

The Logan Machine Shops, Inc., Logan, W. Va., machinery dealer, has inquiries out for a japanning oven, suitable for handling large electrical armatures, electric or natural gas operation; also for industrial motors.

Chicago

CHICAGO, May 30.

MAY sales in machine tools have run a trifle ahead of the total for April. Fresh inquiry, largely from miscellaneous users, has grown somewhat as compared with the previous week, but there are no indications of any marked activity. The used tool market is moderately active, particularly in the larger sizes of machine shop equipment.

The Santa Fe continues to buy on its list, several orders for grinders having been placed this week. The Northern Pacific is also buying a few miscellaneous tools. The inquiry for four 36-in. lathes by the Illinois Steel Co. is said to be still open. Several users of planers have sent orders through on requisitions that were made two or three months ago.

The George D. Roper Corporation, Rockford, Ill., has taken over from the J. G. White Management Corporation, New York, the production and sale of the Kennedy sheet flame radiant heater. The Brooklyn, N. Y., plant will be closed and all machinery, dies, pattern equipment and tools will be moved to Rockford.

The Borin Mfg. Co., 1325 South Cicero Street, Cicero, Ill., manufacturer of picture frames, etc., is having plans drawn for a new one-story plant to cost about $200,000 with machinery. J. J. Novy, 2434 South Ridgeway Avenue, Detroit, is architect. F. F. Martin is secretary.

The Metal Devices Corporation, 2466 North Maplewood Avenue, Chicago, manufacturer of screw machines, etc., has leased a two-story and basement building, 60 x 125 ft., for expansion.

The Denver Equipment Co., Denver, Colo., Arthur C. Daman, head, is planning the installation of a new flotation mill at its Butterfly mining properties at Telluride, Colo., to cost in excess of $150,000.

The Village Council, Litchfield, Minn., is asking bids until June 6 for boiler, stoker and auxiliary equipment for the municipal power station. L. P. Wolff, St. Paul, Minn., is consulting engineer.

The Consolidated Smelting & Metals Co., Denver, Colo., recently formed with a capital of $10,000,000 by E. J. Kane, 1224 Colfax Street, and associates, is reported to have plans under way for a new smelting plant at Golden, Colo., with initial unit to cost in excess of $300,000 with machinery.

Sears, Roebuck & Co., Arthington Street and Homan Avenue, Chicago, are said to be planning the early rebuilding of the portion of their stove manufacturing plant at Kankakee, Ill., destroyed by fire May 12, with loss reported at close to $100,000 with equipment.

The John Deere Tractor Co., Waterloo, Iowa., will soon ask bids on a general contract for a one-story addition 120 x 300 ft., to cost in excess of $100,000 with equipment.

The National Vending Machine Co., Inc., 338 United States National Bank Building, Denver, Colo., has been organized to manufacture a combined printing and vending machine for the mechanical delivery of accident insurance policies. The company is seeking bids for the tools, dies, etc., for the production of the machine, and also is desirous of placing a contract for the manufacture of the first few thousand units. C. W. Cole is president of the company.

Philadelphia

PHILADELPHIA, May 30.

LOUIS GERTSKI, Philadelphia, care of Mastbaum Brothers & Fleisher, 1424 South Penn Square, real estate, has concluded arrangements for the erection of a three-story and basement automobile service, repair and garage building on Cherry Street, to cost $550,000 with equipment. It will be built by the realty company and occupied under lease.

The Department of Public Works, Bureau of Water, City Hall, Philadelphia, is asking bids until June 8 for a pumping plant, 66 x 258 ft., on Wheatsheaf Lane. George H. Biles is director. The estimated cost is $500,000.

The Board of Education, Keystone Building, Nineteenth Street, Philadelphia, is asking bids until June 7 for steel lockers, hardware and kindred equipment. William Dick is secretary and business manager.

Howard M. Bingaman, trustee in bankruptcy for the Harrisburg Foundry & Machine Works, Harrisburgh, Pa., has been authorized by creditors to offer the plant at public sale, free of all incumbrances.

The Board of Education, Juniata, Pa., contemplates the installation of manual training equipment in its proposed new high school, to cost about $200,000, for which bids will soon be asked by Hersh & Shollar, Commerce Building, Altoona, Pa., architects.

The General Truck Co., York, Pa., organized to manufacture motor trucks, has leased the former car shops of Billmeyer & Small for the establishment of a plant.

Officials of the Pennsylvania Power & Light Co., Allentown, Pa., have organized the Pine Grove Township-Schuylkill County Power & Light Co., a subsidiary to operate at Pine Grove, Pa., and vicinity. Plans are under way for development.

The Hazel Brook Coal Co., Pottsville, Pa., and Land Title Building, Philadelphia, plans the construction of a new coal breaker at its Girard Colliery, near Pottsville, to replace a plant destroyed by fire May 24, with loss close to $50,000 including machinery.

The School Board of the city of Lancaster, Pa., plans the installation of manual training equipment in a proposed three-story junior high school, to cost about $500,000, for which plans will be drawn by C. Emlen Urban, Woolworth Building, architect. William Ittner, Board of Education Building, St. Louis, is consulting architect.

Huff Daland Airplanes, Inc., Bristol, Pa., has changed its corporate name to the Keystone Aircraft Corporation.

The American Alloy Tool Co., 240 East Wishart Street, Philadelphia, has been incorporated to manufacture alloy cutting tools and to carry on the smelting and refining of alloys. Equipment has been purchased and the company expects to get into production at once.

Cincinnati

CINCINNATI, May 30.

INCREASED sales the past week are reported by machine tool builders, the improvement in the last 10 days having been so marked that bookings during May were about 10 to 15 per cent ahead of those in April and, almost without exception, exceeded those in May, 1926. Inquiries now pending are promising, and manufacturers are of the opinion that business through June will be fairly good.

The Southern Railway has bought seven lathes, three of which will be furnished by a Cincinnati company and four by a Sidney, Ohio, company. The Baltimore & Ohio has placed two lathes locally and is understood to have purchased 14 lathes from a Sidney machine tool builder. Three automobile makers in the Detroit district have ordered a number of lathes, these transactions being negotiated by a local tool company. The Cincinnati, Hamilton & Dayton Railway Co., Dayton, is the buyer of a 14-in. 400-ton wheel press. An inquiry for approximately 50 polishing machines is expected to be closed within the next two weeks.

The J. P. Gordon Co., 270 North Fourth Street, Columbus, Ohio, manufacturer of automobile equipment, is contemplating the erection of a new five-story plant, 175 x 250 ft., to cost in excess of $300,000 with machinery.

The Tennessee Paper Mills, Inc., North Chattanooga, Tenn., is reported to be planning the erection of a new plant unit for the production of fireproof shingles under a special process, to cost approximately $85,000 with equipment. A. M. Shepherd is vice-president in charge.

The L. J. Breed Equipment Co., James Building, Chattanooga, Tenn., has inquiries out for a portable crushing plant, complete with crusher, screen, elevating equipment, etc.

The Mississippi River Commission, Memphis, Tenn., is asking bids until June 6, for one fuel oil-burning system, complete with burners and accessories.

Buffalo

BUFFALO, May 30.

THE Elias Aircraft Corporation, 965 Elk Street, Buffalo, has plans under way for a one and two-story plant at the Buffalo airport at Cheektowaga, N. Y., to cost approximately $100,000 with equipment.

The Worthington Pump & Machinery Corporation, Clinton and Roberts Streets, Buffalo, is completing the transfer of its Blake & Knowles works, Cambridge, Mass., to the local plant, which will be arranged to provide for about 30 per cent increase in former output. The plant will concentrate largely on the production of double-acting, two-cycle Diesel engine units for export, as well as gas engines and affiliated power equipment.

The Board of Education, Arcade, N. Y., plans the installation of manual training equipment in its proposed two-story high school, to cost close to $175,000, for which superstructure will soon begin. A. F. Gilbert, 358 Fifth Avenue, New York, is architect.

The Solvay Process Co., Solvay, N. Y., is reported to be arranging for the rebuilding of its soda ash plant at Hutchinson, Kan., to cost close to $200,000 with equipment.

C. T. Seager, 426 Elmwood Avenue, Niagara Falls, N. Y., has plans for a one-story sheet metal-working plant, to cost more than $20,000 with equipment.

The Searle Street Sign Co., Inc., 183 St. Paul Street, Rochester, N. Y., has been organized to manufacture street intersection signs and other metal specialties. Manufacturing at present is being done by contract.

Stacy, Von Selling, Inc., 542 Ellicott Square Building, Buffalo, has been appointed agent in the Buffalo district for the Fitzsimons Co., Youngstown.

Detroit

DETROIT, May 30.

PLANS are being prepared by the Bohn Aluminum & Bronze Corporation, 2512 East Grand Boulevard, Detroit, for a one-story foundry addition for the production of aluminum castings, to cost in excess of $50,000 with equipment. C. W. Brandt, Kresge Building, is architect.

The Common Council, St. Clair Shores, Mich., contemplates the installation of pumping machinery and other power equipment in connection with a proposed municipal waterworks, for which a bond issue of $435,000 has been approved.

The Graham Brothers, recent purchasers of the Paige-Detroit Motor Car Co., Detroit, and the former plant of the Harroun Motors Co., Wayne, are reported to have completed plans for a one-story addition, 100 x 600 ft., to the last noted works for body manufacture, to cost in excess of $300,000 with equipment.

The Shakespeare Products Co., Kalamazoo, Mich., manufacturer of domestic metal goods, can openers, etc., has work under way on an addition to provide about 20 per cent increase in floor space and facilities, to cost approximately $25,000 with equipment.

The Koestlin Tool & Die Co., 3601 Humboldt Street, Detroit, has begun the erection of an addition, for which a general contract recently was let to Fred M. Stokes, Oregon Street, to cost more than $35,000. Additional equipment will be installed. Janke, Venman & Krecke, 1346 Broadway, are architects.

The Watts Mfg. Co., Benton Harbor, Mich., recently organized by Alfred R. and Robert J. Watts, 1096 Ogden Avenue, to manufacture laundry machinery, parts, etc., has awarded a general contract to the M. W. Stock Construction Co., for a new plant, to cost about $45,000 with equipment.

The Kalamazoo Stationery Co., Kalamazoo, Mich., manufacturer of paper goods, etc., is considering the erection of a two-story factory to cost $50,000 with equipment.

The Mueller Brass Co., Port Huron, Mich., manufacturer of plumbers' brass goods, is said to have plans for a one and two-story addition, to cost more than $350,000 with equipment. The company recently disposed of a bond issue of $1,100,000.

The Sawyer Mfg. Co., Inc., Hudson, Mich., has been organized as a successor to the Sawyer Shade & Lamp Co. and will manufacture wire display racks and kindred metal products. The company is in the market for a small quantity of materials and equipment.

The Sorg Ladder Mfg. Corporation, 615 Crofton Street, Grand Rapids, Mich., has been organized to manufacture a patented metal and wood ladder. Equipment has been purchased and the company is ready to begin operations.

New England

BOSTON, May 30.

THE closing days of May witnessed some improvement in machine tool sales in this territory, but business was by no means active, and a majority of houses report total bookings for the month under those for April. Recent sales include two drill presses and a key seater to a Connecticut shop, a 25-in. upright drill and two other tools, part of a small list, to a Massachusetts engineering firm for export, two Pratt & Whitney tool room lathes to a company in the Springfield district, a similar lathe to a Connecticut shop, two bench grinders to a Rhode Island plant, a radial drill to the Boston & Maine Railroad, a 32-in. shaper to a Vermont shop, a 16-in. tool room lathe to a Woonsocket, R. I., plant, a used speed lathe to a local sugar company, several small drills, a shaper, a press and two fair sized lathes, all used, to firms in or near Boston. Some tools sold recently have been under negotiation since February. New inquiries are decreasing rather than increasing, yet there remains a large amount of equipment under negotiation on old inquiries, which in view of the gradual improvement in New England machine shop activities, appears nearer closing than was the case the middle of May.

The Massachusetts Auto Repair Co., 1176 Massachusetts Avenue, Boston, will erect a shop to cost about $15,000.

Plans are in progress for a two and five-story mill for the Superior Cabinet Works, Inc., 93 Newell Avenue, Pawtucket, R. I. R. L. Norston is president.

Harry M. Ramsay, 184 Boylston Street, Boston, architect, has completed plans for a one-story, 150 x 300 ft. plant for the Agar Mfg. Corporation, Medford, Mass.

Benjamin Proctor, Jr., 25 Arch Street, Boston, has completed plans for a one-story addition to the Wellesley, Mass., junior high school, to contain a manual training department. Lockwood J. Towne is chairman of the building committee.

Work is about to start on a two-story, 20 x 386 ft. overhead coal pocket for G. Bonazzoli & Son, 173 Washington Street, Hudson, Mass., for which conveying equipment is needed. H. C. Brown, 195 Medford Street, Charlestown district, Boston, is the architect.

M. A. Dyer, 1 Beacon Street, Boston, architect, will draw plans for a trade school to cost $180,000 for Southbridge, Mass. H. M. Le Clair is chairman of the building commission.

The Emerson Mfg. Co., Market Street, Lawrence, Mass., manufacturer of paper mill machinery, pulp mill equipment, etc., has filed plans for a one-story addition, 50 x 220 ft., to cost more than $60,000 with equipment.

The Eastern Insulated Wire Co., Tilton, N. H., recently organized by William and Richard Scott, Needham, Mass., has leased a portion of the No. 1 Tilton mill of the American Woolen Co., a three-story structure, for the manufacture of insulated wire. William Scott is president and Richard Scott, general manager; William Dexter, Concord, Mass., is vice-president.

The Worthington Pump & Machinery Corporation, Holyoke, Mass., has awarded a general contract to the Casper Ranger Construction Co., Holyoke, for a one-story addition to its machine shop, reported to cost close to $50,000 with equipment.

The Deerfield Glassine Co., Monroe Bridge, Mass., recently organized, has taken over the local mill of the James Ramage Paper Co., which has been idle for several months, and will remodel for a new plant for the manufacture of glassine and processed papers. It is expected to have the plant ready for service in September. Joseph H. Wallace is president and general manager; William L. Ross, treasurer, and Frank E. Greenwood, secretary and production manager.

The Apco Mfg. Co., Eddy Street, Providence, R. I., manufacturer of metal goods, has purchased the Frank Mossberg Corporation, Attleboro, Mass., manufacturer of wrenches and other tools, and will consolidate under the name of the Apco-Mossberg Corporation, with combined assets approximating $2,000,000. Operations will be concentrated at the Attleboro plant and the purchasing company will remove the Providence works to that location. Operations will be given over largely to the manufacture of automobile parts and accessories, and other metal goods.

The G. W. Hoar Co., 18 Bedford Street, Waltham, Mass., manufacturer of electrical fixtures and equipment, is having plans drawn for a two-story plant at West Newton, Mass., primarily for assembling and finishing work. It will cost close to $50,000. L. G. Bracket, 88 Tremont Street, Boston, is architect.

The United Electric Light Co., Springfield, Mass., has authorized the immediate construction of a new power substation for switching and other service on a 50-acre tract of land recently acquired at West Springfield, to cost about $650,000 with equipment.

The Hendey Machine Corporation, Torrington, Conn., has been organized as a subsidiary of the Hendey Machine Co. to supervise sales of the parent company in certain territories.

St. Louis

ST. LOUIS, May 30.

PLANS are being arranged by the Missouri Portland Cement Co., Post Dispatch Building, St. Louis, for extensions and improvements in its Prospect Station mill, with new unit, 40 x 400 ft., and other structures, to cost more than $1,500,000 with machinery. The expansion program is scheduled for completion in about 9 months. The F. L. Smidth Co., 50 Church Street, New York, is engineer.

The J. T. Craven Co., Century Building, St. Louis, architect and engineer, has completed plans for a one-story and basement automobile service, repair and garage building, 80 x 210 ft., to cost about $80,000 with equipment.

The Board of Education, Nebraska City, Neb., contemplates the installation of manual training equipment in a three-story junior high school, to cost $145,000, for which plans are being drawn by J. H. Felt & Co., 300 West Forty-seventh Street, Kansas City, Mo., architects.

The Roach-Harb Ford Agency, El Dorado, Ark., representative for the Ford automobile, has plans for a new service, repair and garage building, to cost approximately $100,000 with equipment.

The Superior Enamel Products Co., Tenth and Mullanphy Streets, Clayton, Mo., has plans for a new one-story factory, 90 x 140 ft., to cost about $25,000 with equipment. Manske Bartling, 410 North Euclid Street, Kansas City, Mo., is architect.

The Boyd-Pate Grain & Milling Co., Joplin, Mo., plans the rebuilding of the portion of its mill, including elevator and mixing department, recently destroyed by fire with loss reported at $55,000, including equipment.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, is reported to be planning the early construction of additions to its plant at St. Louis, devoted to the manufacture of concrete lighting standards, to cost more than $350,000 with equipment. The company also purposes to construct a new local unit for the production of accessories for concrete lighting standards.

The Gould Castings Corporation, 5256 Vernon Street, St. Louis, recently organized by A. R. Gould, works manager for the St. Louis Malleable Casting Co., and associates, is completing arrangements for the establishment of its proposed plant on property lately acquired in the Fairfax industrial district, Kansas City, Mo., to consist of foundry, pattern shop, machine shop and other structures, for the production of gray iron, steel, malleable iron and other castings. It is reported to cost more than $100,000 with equipment. Mr. Gould is president of the new company; and C. L. Schultz, secretary.

The Southwestern Bell Telephone Co., Eleventh and Pine Streets, St. Louis, has awarded a general contract to the Fuller-Green Construction Co., Rialto Building, Kansas City, Mo., for a two-story and basement equipment storage and repair building at Kansas City, 124 x 324 ft., including automobile service and garage building, to cost approximately $150,000 with equipment.

The municipal government of Cartagena, Colombia, will ask bids for equipment for a new waterworks to cost $1,500,000 with machinery and pipe. The Colombian Congress has voted an appropriation in this amount for the p oject. Details at the office of the Bureau of Foreign and Domestic Commerce, Washington, reference Colombia No. 239690.

The Chicago Pneumatic Tool Co., for the quarter ended March 31, shows a net profit of $210,277 after depreciation, interest and Federal taxes, equivalent to $2.21 a share earned on 94,994 shares of stock. This compares with $199,146, or $1.90 a share on 104,553 shares of stock outstanding in the first quarter of 1926.

Indiana

INDIANAPOLIS, May 30.

A BOND issue of $450,000 is being sold by the Insley Mfg. Co., East St. Clair and Olney Streets, Indianapolis, manufacturer of gasoline excavators, steel derricks, and kindred heavy machinery, a portion of the fund to be used for plant expansion and the installation of additional equipment. Plans are being drawn for a one-story machine shop to cost about $100,000 with machinery. William H. Insley is president.

The Standard Oil Co., Michigan City, Ind., has plans for a one and two-story storage and distributing plant to cost $80,000 with equipment. J. M. Forrest is local manager.

The McLaughlin Mill & Supply Co., Hammond, Ind., has awarded a general contract to John F. Rahn, East Chicago, Ind., for a three-story addition, 45 x 100 ft., to cost $50,000 with equipment. J. T. Sutton & Son, Hammond Building, are architects.

The Stone Chevrolet Co., 536 East Washington Street, Indianapolis, representative for the Chevrolet automobile, has plans under way for a two-story service, repair and sales building, 50 x 200 ft., to be occupied under lease. George V. Bedell, Aetna Trust Building, is architect.

The Armacost Auto Co., 602 North Capitol Avenue, Indianapolis, local representative for the Studebaker and Erskine automobiles, has leased a four-story building, totaling more than 50,000 sq. ft. of floor space, for a new service, repair and sales building. The entire fourth floor of the structure will be equipped as a machine and repair shop. The present business will be removed to the new location.

Carl Furst, Bedford, Ind., operating a stone-working plant at 1503 Fourteenth Street, Bedford, Ind., has completed plans for a one-story mill addition, to cost about $75,000 with cutting, polishing and other machinery.

The Flexible Conveyor Chain Corporation, South Bend, Ind., has been incorporated with a capital stock of $100,000 to manufacture conveyor equipment, particularly a new type of radius chain. At present manufacture is being carried on by contract. R. L. Mudge, president of the company, may be addressed at 207 Christman Building, South Bend.

South Atlantic States

BALTIMORE, May 30.

PLANS have been filed by Call Carl, Inc., 623 H Street, N. W., Washington, Louis C. Carl, secretary, for a four-story automobile service, repair and garage building, 50 x 215 ft., to cost about $230,000 with equipment. A rebuilding department will be installed in connection with machine and repair works.

The Board of District Commissioners, District Building, Washington, is asking bids until June 7 for tubular steel poles for the electrical department.

The Board of Education, Asheville, N. C., plans the installation of manual training equipment in a proposed three-story senior high school, to cost $700,000 with equipment, for which foundations will soon be laid. Douglas D. Ellington, Flat Iron Building, is architect.

The Virginia Central Railway Co., 628 East Main Street, Richmond, Va., plans the purchase of one or more water tanks from 5000 to 15,000 gal. capacity, each, on metal tower, from 50 to 75 ft. high.

R. L. Minar, Inc., 1405 New York Avenue, Washington, has inquiries out for a shovel, either steam or gasoline-operated.

The Norfolk & Western Railway Co., Roanoke, Va., Clyde Cocke, room 351, purchasing agent, is asking bids until June 8 for 250,000 tie-dating nails, contract serial No. AA-469; 12 cast steel side frames, contract serial No. AA-468; and 6 cast steel truck bolsters, contract serial No. AA-467.

The East Coast Utilities Co., Richmond, Va., has acquired an ice-manufacturing and cold storage plant on Hermitage Road, with daily output of about 50 tons. Plans are under consideration for expansion and the installation of additional equipment.

Bids are being asked until June 16 by the Veterans' Bureau, Washington, for lathes, bandsaws, jointers and universal bench saws for manual training service.

Officials of the Western Paper Makers Chemical Co., Kalamazoo, Mich., have organized a subsidiary to be known as the Georgia-Louisiana Chemical Co., with headquarters at Atlanta, Ga. Plans are under way for the construction of a new plant at East Point, Ga., for the production of alum and kindred products, to cost more than $100,000 with machinery.

The Board of Education, Baltimore, has engaged William F. Stone, Munsey Building, architect, to prepare plans for a one-story mechanical shop, storage and distributing plant, to cost more than $50,000 with equipment, for which bids will soon be asked on a general contract.

The Carolina Power & Light Co., Raleigh, N. C., has arranged a construction and improvement program to cost about $25,000,000, including work now in progress. A hydroelectric power plant is in course of construction on the Yadkin River, near Norwood, N. C.; work is also under way on a similar power development on the Pigeon River, near the Tennessee State line. Extensions will be made in transmission lines and new power substations built.

The Southern Cotton Oil Co., Dawson, Ga., has work under way on an addition to its plant, to cost about $75,000 with equipment.

The Korner-Wilson Co., 128 South Salisbury Street, Raleigh, N. C., has inquiries out for metal stamping and shaping machines for the production of snap fasteners and kindred small metal goods; also for turning machines to handle hard rubber, as well as hard composition goods.

The Board of Public Works, Water Works Bureau, W. Z. Smith, superintendent, Atlanta, Ga., plans a fund of about $500,000 for extensions and improvements, including the installation of additional equipment in power houses and pumping plants. It is understood that bids will soon be asked for coal-handling machinery, mechanical stokers and kindred equipment. J. N. Elley, Atlanta Trust Building, is consulting engineer.

Gulf States

BIRMINGHAM, May 30.

ARRANGEMENTS have been made by the Fort Worth Steel & Machinery Co., Fort Worth, Tex., for the purchase of 25 acres of land, formerly used by the Texas Motor Car Co. The site is improved with two one-story buildings, each 100 x 500 ft. The new owner will use the property for expansion. A tank shop will be installed in addition to other departments. Guy L. Waggoner is president.

The Southwestern Public Service Co., Amarillo, Tex., has begun the erection of a second unit at its steam-operated electric generating plant to increase the capacity about 5000 kw. It is reported to cost in excess of $400,000 with machinery. The Day & Zimmerman Engineering & Construction Co., Sixteenth and Walnut Streets, Philadelphia, is engineer. L. L. Ferre is general manager.

David D. Gibson, 1517 North Thirty-sixth Place, Birmingham, Ala., has inquiries out for spring motors and is desirous of getting in touch with manufacturers of equipment of this kind.

The Texas Public Service Co., Newton, Tex., recently organized as a subsidiary of the Texas Power & Light Co., Dallas, is planning the installation of a generator, oil engines and auxiliary equipment for a power plant in the Newton district.

The Burnet Copper Mining Co., Burnet, Tex., has taken over the local properties of the Sheridan Mining Co., and plans the installation of equipment for development and operation.

The Board of Education, Brownwood, Tex., is considering the installation of manual training equipment in a new two-story and basement junior high school to cost $250,000, for which plans are being drawn by Phelps & DeWees, Gunter Building, San Antonio, Tex., architects.

The International Motor Co., 25 Broadway, New York, manufacturer of Mack motor trucks, has leased a building now in course of erection at New Orleans, totaling about 28,000 sq. ft. of floor space, for a new factory branch and distributing plant, including service and repair departments. Rathbone Debuys, Hibernia Building, New Orleans, is architect.

The Louisiana Central Lumber Co., Clarks, La., plans the rebuilding of the portion of its lumber mill destroyed by fire May 18, with loss in excess of $450,000 with equipment.

The Southwest Gas Co., Yoakum, Tex., comprising a merger of the MacThwaite Oil & Gas Co., Pontotoc Pipe Line Co., DeLeon Gas Co., and other utilities, is disposing of a bond issue of $3,000,000, a portion of the proceeds to be used for expansion and improvements, including pipe line construction. J. W. Colvin is president. Sanderson & Porter, 52 William Street, New York, are engineers.

The Texas Electric Service Co., Indiana Street, Wichita Falls, Tex., has plans under way for a new equipment storage and distributing plant, with repair division, 70 x 140 ft., to cost about $40,000 with equipment. Voelcker & Dixon, Kahn Building, are architects.

The Edinburg Independent School District, Edinburg, Tex., plans the installation of manual training equipment in a two-story junior high school to cost $325,000, for which superstructure will soon begin. Giesecke & Harris, 207 West Seventh Street, Austin, Tex., are architects.

The General Machine Works, 3606 Polk Avenue, Houston, Tex., has been reincorporated under the name of the Staytite Co., and will continue the manufacture of oil conservation and tank equipment.

The Dallas, Tex., office of the Harnischfeger Corporation, Milwaukee, has been removed from the Fidelity Union Building to the Construction Industries Building.

Pacific Coast

SAN FRANCISCO, May 30.

THE California Electrical Mfg. Co., Inc., Stockton, Cal., recently formed with a capital of $75,000 to manufacture electric water heaters, will operate a plant at 318 East Lafayette Street, in conjunction with the plumbing and heating business of Brandt Brothers.

William Priester, Los Angeles, care of C. S. Arganbright, Hollywood Guaranty Building, architect, has plans for a one-story machine shop, 72 x 100 ft., to cost $18,000 with equipment.

The Moore Dry Dock Co., Oakland, Cal., is developing a department of its works for the manufacture of automatic refrigerators.

Following a consolidation of the Diamond Ice Co., San Diego, Cal., and the Mesa Dairy & Ice Co., Mesa, Ariz., plans are being arranged for a new ice-manufacturing plant at Phoenix, Ariz., to cost approximately $200,000, with machinery. It is also proposed to enlarge the present ice plant at Mesa, with installation of additional equipment, to cost $100,000.

The Earl C. Anthony Co., 2111 Webster Street, Oakland, Cal., automobile dealer, has engaged Bernard Maybeck, Lick Building, San Francisco, architect, to prepare plans for a new two-story service, repair and garage building at Oakland, to cost $110,000 with equipment.

George D. Brown & Sons, Inc., Chelan, Wash., has plans for the immediate erection of a three story ice and cold storage plant, 100 x 200 ft., to cost about $100,000 with machinery.

The City Council, Ephraim, Utah, has plans for a municipal electric light and power plant to cost $40,000 with equipment. A special election has been called on June 14 to approve bonds for the project.

The California-Oregon Power Co., 454 California Street, San Francisco, a subsidiary of the Standard Gas & Electric Co., 231 South La Salle Street, Chicago, is arranging to double the capacity of its hydroelectric generating plant now in course of construction on the Rogue River near Medford, Ore., with installation of new 22,000 hp. unit and auxiliary machinery. The ultimate plant will have a capacity of 66,000 hp. A steel tower transmission line will be built, for connection with the present system at Medford. The company is operated under the direction of the Byllesby Engineering and management corporation.

The Spaulding Pulp & Paper Co., Newberg, Ore., has work under way on a new local pulp and paper mill and plans the early installation of equipment. It will cost in excess of $350,000 with machinery.

The Consumers Ice & Cold Storage Co., Ninth and C Streets, Sacramento, Cal., has plans under way for a three-story addition to its ice-manufacturing and cold storage plant, to cost $125,000 with equipment. H. L. Lincoln, 354 Pine Street, San Francisco, is engineer.

The Wade Engineering Co., 1855 Industrial Street, Los Angeles, has been appointed distributor in California for the Lincoln Electric Co., Cleveland. At the Oakland branch, 69 Webster Street, a complete line of Linc-Weld motors and Stable-Arc welders with service parts will be carried. The Los Angeles branch will handle the sale of motors and the A. H. Peir Co. in that city will continue the sale of welders in southern California.

Canada

TORONTO, May 30.

PURCHASES of machine tools by the Canadian Pacific Railway for its Eastern and Western shops was the outstanding feature in this market the past week. The new shops at Winnipeg will require considerable new equipment, only a small portion of which has so far been purchased. The Canadian National and the Wabash are expected to issue a large list of tools for installation in the proposed Pembroke plant.

The automotive industry is making new records in motor car production and appears more interested in keeping plants in shape for capacity operations. Replacement orders from this source have also had a stimulating effect on machine tool sales. Single tools for garages and repair plants are in good demand. Mining machinery and general supplies have been more active and some large orders have been closed recently.

The Nipigon Hydro Electric System, Fort William, Ont., which now generates 75,000 hp. for consumption at the head of the Great Lakes will be increased to 230,000 hp. Plans have been prepared for the development of 100,000 hp. additional at Virgin Falls and Portage Island, and 55,000 hp., is at present being developed at Alexander Landing.

The Town Council, Streetsville, Ont., will purchase a new turbine for the local electric light and power plant at an estimated cost of $4,000. S. H. Smith is clerk.

The Koppers Co., Pittsburgh, will build a plant at Montreal, adjoining the present gas works at LaSalle, for the Montreal Coke & Mfg. Co., the organization under which coke will be produced for the Montreal Light, Heat & Power Consolidated.

The Cockshutt Plow Co., Brantford, Ont., will build an addition to its plant, including an extension to the power house.

The Niagara Frontier Ice Co., Bridgeburg, Ont., will erect an artificial ice plant at a cost of $75,000. Construction will start within a few weeks. Joseph J. Geigand, Buffalo, is architect.

The Stephens-Adamson Mfg. Co., Aurora, Ill., manufacturer of conveying transmission and screening machinery, will place a manufacturing plant in operation at Belleville, Ont., on June 1, for supplying its Canadian trade. It will be in charge of G. A. Freeman.

Foreign

The International Power Securities Co., New York, J. E. Aldred, 40 Wall Street, president, operating electric light and power properties in Italy and France, has arranged for an increase in its paid-up capital to $7,500,000, a portion of the proceeds to be used for expansion and betterments and acquisition of additional properties. The company will dispose of a preferred stock issue of 75,000 shares.

The Marma & Langrors Aktiebolag, Stockholm, Sweden, has plans under way for the construction of a new sulphite pulp mill at its Marma works, to cost more than $400,000 with machinery. It is scheduled for completion in about 18 months.

The General Motors Corporation, General Motors Building, Detroit, is completing plans for the construction of a new assembling plant on the Hammarby Canal, in the south district of Stockholm, Sweden. The initial unit is estimated to cost close to $700,000, with machinery and will have a capacity of about 6000 cars per annum, the majority of Chevrolet type.

The Compagnie Industrielle Maritime, Havre, France, operating a petroleum depot and other oil properties, has plans for a new oil refinery and will begin work soon. It is reported to cost more than $250,000 with equipment.

The Isarco Hydro-Electric Co., Societa Idroelettrica dell'Isarco, Rome, Italy, has disposed of a bond issue of $5,000,000, the majority of the proceeds to be used in connection with a hydroelectric project now under way on the Isarco River, Trentino, designed for an ultimate capacity of 227,000 hp., and estimated to cost about $12,500,000 with transmission system. The plant is scheduled for completion in 1930. H. E. Gruner, Basle, Switzerland, is engineer for the company. Hallgarten & Co., 44 Pine Street, New York, investment securities, are fiscal agents in the United States.

The Chamber of Deputies, Paris, France, has granted a concession to a French company for the construction and operation of a power plant on the first section of the canal to be built between Strasbourg, France, and Basel, Switzerland. Plans will be drawn in the near future and estimates of cost made. Information at the office of the Bureau of Foreign and Domestic Commerce, Washington; also, at the American Consulate, Strasbourg, John D. Johnson, consul.

The Allen & Garcia Co., 21 East Van Buren Street, Chicago, consulting engineer, has been engaged by the Soviet Russian Government to develop coal mining properties in the Donetz Basin district. A number of new shafts will be sunk, and machinery installed for this purpose, as well as erection of buildings, tipples, shops and other structures. John A. Garcia of the Allen & Garcia Co. will supervise the expansion. The Amtorg Trading Corporation, 165 Broadway, New York, official purchasing agency for the Soviet Union, will be active in the work. The entire extension program in the Russian coal mining districts during the present year is estimated to cost $59,740,000.

Fabrica de Clavos de Tampico, S. A., Tampico, Mexico, is desirous of getting in touch with manufacturers of equipment for galvanizing wire nails. H. H. Fleishman is manager.

A patent infrigement suit affecting the Welch plug for closing holes in castings, particularly those of automobile engines, was settled in favor of the plaintiff, the W. D. Hubbard Spring Co., Pontiac, Mich., by decision in a Federal Court in Detroit, May 24.